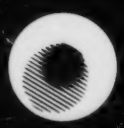
Sustainable Development in the Caribbean

John Cox
and
C. (Sid) Embree



The Institute for Research on Public Policy
L'Institut de recherches politiques

The Institute for Research on Public Policy

A National Presence

Founded in 1972, the Institute for Research on Public Policy is an independent, national, non-profit organization with offices across Canada.

The mission of the Institute is to improve public policy in Canada by promoting and contributing to a policy process that is more broadly based, informed and effective.

In pursuit of this mission, the Institute:

- identifies significant public policy questions that will confront Canada in the longer term future, and undertakes independent research into those questions;
- promotes wide dissemination of key results from its own and other research activities;
- encourages non-partisan discussion and criticism of public policy issues in a manner which elicits broad participation from all sectors and regions of Canadian society, and links research with processes of social learning and policy formation.

Governance of the Institute

The Institute is governed by a Board of Directors, advised by representatives of federal, provincial and territorial governments and of other national research organizations, and by panels of external authorities, drawn into *ad hoc* advisory committees formed to assist the Research Committee. Implementation and administration of the Institute's policies and programs and management of the staff are the responsibility of the president, who is the chief executive officer.

Method of Operation

The Institute is decentralized, employing researchers across Canada. This ensures that research undertaken by the Institute involves contributions from all regions. The Institute also works with individual researchers or institutes in other countries.

Researchers are hired on contract for a limited period, often the duration of a project. This enables the Institute to renew its staff regularly, to reflect the evolving nature of its research program. It also helps to increase the number of first-class researchers employed by the Institute.

Independence and Neutrality

The Institute's independence is assured by an endowment fund, to which federal and provincial governments and the private sector have contributed. The Institute receives grants and contracts from governments, corporations and foundations, both to support program activity and to carry out specific research projects.

The Institute promotes public understanding and discussion of issues of national importance, whether controversial or not. It publishes its research findings with clarity and impartiality. It does not control or influence the conduct of particular research or the conclusions: conclusions or recommendations in a publication of the Institute are solely those of the author, not of the Institute, its Board or contributors. The Institute maintains neutrality on issues of public policy.

The president bears final responsibility for the decision to disseminate information under the Institute's imprint. He is advised on the accuracy and objectivity of a manuscript by both Institute staff and outside reviewers. Publication of a manuscript signifies that it is deemed to be a competent treatment of a subject worthy of public consideration. Publications of the Institute are in the language of the author, with an executive summary in both official languages.

91-05042/

Sustainable Development in the Caribbean

A Report on the Public Policy Implications of Sustainable Development in the Caribbean Region Conference

May 28-30, 1990
Kingston, Jamaica

Sustainable Development in the Caribbean

A Report on the Public Policy Implications of Sustainable Development in the Caribbean Region Conference

May 28-30, 1990
Kingston, Jamaica

Compiled and Edited by

John Cox
and
C. (Sid) Embree

Institute for Research on Public Policy
L'Institut de recherches politiques

Copyright © The Institute for Research on Public Policy 1990

Al rights reserved

Printed in Canada

The Institute for Research on Public Policy/
L'Institut de recherches politiques
P.O. Box 3670 South
Halifax, Nova Scotia B3J 3K6

Table of Contents

Foreword ix

Avant-propos xi

Preface xiii

Statement xvii

PART I. THE CHALLENGE OF SUSTAINABLE DEVELOPMENT

Introduction 3
The Environment and Development Challenge 4
The Political and Institutional Challenge 7
The Economics of Sustainable Development 13
Postscript 17

Papers:

The Institutional Challenge of Sustainable Development: A Politico-Administrative Perspective—Ausbert d'Auvergne and Cletus Springer 19

Economic Policy and Sustainable Development in the Caribbean—Clive Y. Thomas 39

PART II. RESOURCES MANAGEMENT AND DEVELOPMENT

Introduction 65
Land and Freshwater Resources 65
Marine and Coastal Resources 77

Productivity Improvement and Waste Management 87
Human Resources Development 95
Postscript 103

Papers:

Water Resources Management for Sustainable Development—Thorant Hardware 105

The Deterioration of Caribbean Coastal Zones: A Recurring Issue in Regional Development—Leonard Nurse 117

Tourism and Sustainable Development in the Caribbean—Ivor Jackson 127

Science, Technology and Sustainable Development in the Caribbean—Desmond Ali 139

Labour and Sustainable Development—Trevor Munroe 151

Human Resources Development: Public Awareness/ Participation Policies and Practices—Peggy Antrobus 161

PART III. THE TRANSITION TO SUSTAINABLE DEVELOPMENT

Introduction 173
Redefining Development from a Caribbean Perspective 173
Integrating Economic Decision-making and the Environment 178
Enhancing the Capacity for National Development 179
Strengthening the Capacity for Regional Integration 180
Postscript 183

Papers:

Rethinking the Development process: The Cultural, Social and Institutional Agendas—Yves Renard 185

Influencing International Institutions—
Angela Cropper 197

Closing Remarks—Roderick Rainford 213

Key to Acronyms 219

Appendix 1: Public Policy Implications of Sustainable Development in the Caribbean Region—Conference Program 221

Appendix 2: List of Background papers 227

Appendix 3: List of Conference Registrants 229

Appendix 4: Constraints and Opportunities to Sustainable Development—Carlos Quesada 235

Foreword

In 1987, the World Commission on Environment and Development (the Brundtland Commission) published its landmark report, "Our Common Future." The Report pictured a new future for the world, one based upon development that provided for the needs of the present without jeopardizing the prospects for the generations yet to come. Sustainable development is a concept that embraces the environment as a mainstream economic issue, along with job creation, equity, and export growth. Although it remains a concern for Ministries of the Environment and of Natural Resources, this new emphasis also envisages the environment as a principal consideration for the central spending agencies of government—finance, treasury, planning, trade, industry and the like.

It was this consideration that led the Institute for Research on Public Policy (IRPP) to meet with the Caribbean Community and Common Market Secretariat (CARICOM) and the Government of Jamaica to plan a conference to explore the public policy implications and options for facilitating more sustainable forms of development in the Caribbean. An advisory planning meeting, hosted by the Government of Jamaica, was held in Kingston in June 1989.

David Runnalls, John Cox and Sid Embree from the IRPP embarked on a series of consultations throughout the Caribbean region with nearly 100 representatives from governments, banks, utilities, industry, business, environmental and other non-governmental groups, regional associations, and the academic community. The Conference agenda, the calibre of speakers and discussants, and the richness of the debates are testament to the value of this rigorous and collegial preparatory process. With its unique blend of participants, representing most interest groups and segments of society from many countries of the region, the Conference will have a substantive and lasting impact not often afforded such events.

As co-sponsors of the Conference, we wish to put on record our sincere thanks to the Canadian International Development Agency (CIDA) for providing the funds required to make the Conference a reality. We also recognize the support of the collaborating agencies—the Caribbean Conservation Association, the UNEP-Caribbean Environment Programme, the Organization of Eastern Caribbean States and the University of the West Indies in preparing for the Conference. Support by the Organization of American States in arranging for the attendance of several participants is also acknowledged.

Finally, the success of a conference of this nature is dependent on the commitment of many individuals. In this context we would like to acknowledge Byron Blake, Dan Chalmers, Jeffrey Dellimore, Norman Girvan, Lorna Gordon-Gofton, Calvin Howell, Donna McFarlane-Gregory, Beverly Miller, LaVerne Ragster, Yves Renard, Naresh Singh, and Pat Thompson who variously helped organize the Conference logistics and press briefings. We would also offer our special thanks to the Conference speakers, discussants and chairpersons. We are especially grateful to the Honourable Winston Dookeran, Minister of Planning and Mobilization with the Government of Trinidad and Tobago, and William Demas, Governor of the Central Bank of Trinidad and Tobago, who took time from their extremely onerous schedules to chair the plenary sessions and actively participate in the entire conference.

A. R. Dobell	Hon. P. J. Patterson	R. Rainford
President	Deputy Prime Minister	Secretary-General
IRPP	of Jamaica	CARICOM Secretariat

Avant-propos

En 1987, la Commission mondiale sur l'environnement et le développement (Commission Brundtland) publiait son fameux rapport "Notre avenir à tous." Celui-ci proposait un nouvel avenir pour le monde, un avenir fondé sur un développement qui répondrait aux besoins de la population actuelle sans compromettre l'avenir des générations futures. Le concept même du développement durable fait de l'environnement une des grandes questions économiques, au même titre que la création d'emplois, l'équité et la croissance des exportations. Même si les questions environnementales continuent de relever des ministères de l'environnement et des ressources naturelles, cette nouvelle orientation oblige désormais les organismes du gouvernement sur lesquels s'articule le budget (les finances, le trésor, la planification, le commerce, l'industrie et les autres) à intégrer l'environnement dans leurs considérations.

Une telle réorientation a incité l'Institut de recherches politiques (IRP) à approcher le secrétariat de la Communauté des Caraïbes (CARICOM) et le gouvernement de la Jamaïque pour organiser un colloque durant lequel on explorerait les implications d'un environnement durable pour les politiques publiques et les façons de favoriser une forme plus durable de développement dans les Antilles. Une rencontre consultative sur la planification de ce colloque s'est déroulée à Kingston en juin 1989, grâce au parrainage du gouvernement jamaïcain.

David Runnalls, John Cox et Sid Embree de l'IRP ont entrepris une série de consultations dans la région des Antilles. À cette occasion, ils ont rencontré près de 100 représentants des gouvernements, des banques, des services publics, des industries, des entreprises, des groupes environnementaux et non gouvernementaux, des associations régionales et des universités. L'ordre du jour du colloque, la renommée des conférenciers et des commentateurs de même que la richesse des débats prouvent sans contredit l'utilité de

ces préparatifs, d'une rigueur toute collégiale. Grâce à la diversité de ses participants, qui représentaient la plupart des groupes intéressés et l'ensemble des couches de la société de nombreux pays de la région, le colloque aura un impact appréciable et persistant, comme peu d'événements du même genre en ont eu.

En tant que parrain conjoint du colloque, nous désirons sincèrement remercier l'Agence canadienne de développement international (ACDI) pour avoir débloqué les fonds sans lesquels ce projet n'aurait pu devenir réalité. Il convient également de souligner l'appui des organismes ayant coopéré aux préparatifs du colloque, notamment la Caribbean Conservation Association, le Programme sur l'environnement des Caraïbes du PNUE, l'Organization of Eastern Caribbean States et l'Université des Indes occidentales. Enfin, on ne peut passer sous silence le fait que l'Organisation des États américains ait pris des dispositions pour que plusieurs participants assistent à l'événement.

Le succès d'un colloque d'une telle envergure dépend souvent du dévouement d'un grand nombre de personnes. C'est pourquoi nous tenons à remercier Byron Blake, Dan Chalmers, Jeffrey Dellimore, Norman Girvan, Lorna Gordon-Gofton, Calvin Howell, Donna McFarlane-Gregory, Beverly Miller, LaVerne Ragster, Yves Renard, Naresh Singh et Pat Thompson qui se sont tour à tour occupés de la logistique et des conférences de presse. Enfin, nous adressons des remerciements particuliers aux conférenciers, aux commentateurs et au président. Plus précisément, nous remercions l'honorable Winston Dookeran, ministre de la Planification et de la Mobilisation du gouvernement de Trinidad et Tobago ainsi que William Demas, gouverneur de la Banque centrale de Trinidad et Tobago pour avoir, malgré un calendrier très chargé, réservé un peu de leur précieux temps, pour présider les plénières et participer activement à l'ensemble du colloque.

A. R. Dobell	Hon. P. J. Patterson	R. Rainford
Président	Vice-premier ministre	Secrétaire général
IRP	de Jamaïque	Secrétariat du CARICOM

Preface

More than 150 key economic decision-makers, academics, government officials, and representatives from international agencies met from May 28 to 30, 1990, in Kingston, Jamaica to discuss the kinds of policy shifts that would be needed throughout the Caribbean, both nationally and regionally, to bring about more sustainable forms of development. The group included the Deputy Prime Minister of Jamaica, the Minister of Planning and Mobilization from Trinidad and Tobago, the Secretary-General of CARICOM, the Governor of the Central Bank of Trinidad and Tobago, the Executive Director of the Caribbean Association of Industry and Commerce, the Director of the Consortium Graduate School of The University of the West Indies, the President of the University and Allied Workers Union, and the President of the Caribbean Conservation Association.

Sustainable development has been described as a matter of "life or death" for the inhabitants of a natural resource dependent area such as the Caribbean. Natural resource-intensity, often in products designed for export, has historically been one of the main features of productive activity in the region. Agriculture, forestry, fishing and, above all, tourism all depend for their economic success on a healthy and productive environment. For example, tourism is heavily dependent on the maintenance of delicate, diverse and densely coupled terrestrial and marine ecosystems; the arable land resource is so limited that agricultural policy will have to minimize negative impacts in terms of land degradation and agricultural pollution; over-fishing, degradation of mangroves and the congestion of maritime transport routes and port facilities threaten what might seem to be limitless coastal and marine resources; and investments in industry, energy, construction and infrastructure must take into account the impacts of pollution, hazardous wastes, conflicts over resource use and the assimilative capacity of the environment.

For these reasons, and to ensure that the meeting was not distracted by a theoretical debate on the various interpretations to which sustainable development is open, authors of background papers were encouraged to focus on the following themes:

- sustaining both economic and "total" development of the Caribbean region requires effective resource management;
- fiscal, budgetary, corporate and personal tax regimes; ecologically-based taxes—e.g., depreciation allowances; trade regimes; subsidies, grants, lease and loan conditions; and regulations that are "environmentally rational;"
- a fundamental objective should be to ensure sustainable and secure livelihoods for the poor;
- the costs and benefits associated with trade-offs between economic, social and biological goals need to be assessed, at least qualitatively if not quantitatively;
- the role of the Caribbean with respect to global environmental issues such as climate change and waste disposal, which impact on the sustainable development capacity of the region.

From a policy perspective, authors were encouraged to focus on recommendations and suggestions that would enhance the capacity of Caribbean countries to:

- design "appropriate" incentives/disincentives for sustainable development for three key areas; e.g.,
  - policy-enabling measures directed at policy-makers and implementing agencies, including measures to strengthen institutions and improve their flexibility, and to render political conditions more conducive to the support of policy development in the topic/issue area—this could include the establishment of sustainable development indicators and resource/economic accounting systems;
  - price change policies (e.g., pricing for goods and services, tax and subsidy reform, trade policy reform, exchange rate modifications, etc.) to induce producers and consumers to manage resources in a more sustainable manner;
  - policies directed at the needs of the resource user, including land and resource rights, participation in decision-making, greater access to information, public awareness and education;
- cope with/respond to international pressures which are limiting their capacity to design, implement and regulate developments that are sustainable, such as:

- policies and conditions of international agencies and institutions regarding such issues as terms of trade, debt financing and regulating "The Commons;"
- policing the unsustainable practices of others; e.g., multinational corporations, other countries.

The resulting papers, and subsequent discussions, admirably addressed these themes in their rich analysis and pragmatic ideas and proposals for action. As a result, and to ensure that this richness is not lost, diluted or misrepresented, the contextual framework of each part of this publication has been built around extracts from the conference papers and tapes, supplemented with two or more edited papers in their entirety. It may be that, in editing these papers for publication, we have lost some nuances of the Caribbean reality, culture and values. If so, the fault is ours and we apologize. Appendix 1 contains the Conference program, Appendix 2 provides a list of papers prepared for the Conference, Appendix 3 lists the Conference registrants, and Appendix 4 contains the presentation by Carlos Quesada, which outlines the approach adopted by Costa Rica for developing its sustainable development strategy. It would be remiss of us if we did not acknowledge the advice and counsel of Edward Barbier in developing the guidelines for Conference papers. We are also deeply grateful to Lois Johnston for her editorial advice and to Maureen Tamarit for co-ordinating the typing of the manuscript.

Finally, immediately following this Preface is a Statement that was prepared by a drafting group—comprising government, private sector, NGO and university representatives— and distributed to participants and the media immediately following the Conference. While the Statement was neither discussed nor adopted by the Conference, it does respond to the wish of the closing Plenary that the value of the debates and the potential policy options identified should be immediately summarized and widely distributed. It now also admirably serves as an executive summary for this publication!

John Cox
C. (Sid) Embree

Statement[1] of the Conference on the Public Policy Implications of Sustainable Development in the Caribbean Region

HOW TO BE FAIR TO THE FUTURE

More than 150 key economic decision-makers, academics, government officials and representatives from international agencies met in Kingston May 28-30, 1990 to discuss the kinds of policy changes needed throughout the Caribbean to bring about sustainable development. The group included the Deputy Prime Minister of Jamaica, the Minister of Planning and Mobilization from Trinidad and Tobago, the Secretary-General of CARICOM, the Governor of the Central Bank of Trinidad and Tobago, the Executive Director of the Caribbean Association of Industry and Commerce and a number of other senior figures in the region from the private sector. The Conference concentrated on the kinds of policy shifts that would be needed, both nationally and internationally to bring about sustainable development in the region.

Sustainable development has been described as a matter of "life or death" for a natural resource dependent area such as the Caribbean. Natural resource-intensity, often in products designed for export, has historically been one of the main features of productive activity in the region. Agriculture, forestry, fishing, and above all, tourism all depend for their economic success on a healthy and productive environment.

Yet there is ample evidence throughout the region that the environment is in trouble. In Jamaica alone the deforestation rate is

[1] This Statement was prepared by a drafting group at the request of the closing plenary. While it was not formally presented to or adopted by the Conference, it was made available to participants and released to the media.

3.3 per cent per annum and is among the highest in the world. Soil erosion is stripping the productive highlands and leading to siltation of some of the region's coral reefs, and to the elimination of critical fish habitat. Both surface and underground water supplies are under pressure because of overuse and are subject to pollution. Looming over all of this is the threat of major man-induced threats to the world's climate. Although the main causes of global warming stem from the 20 per cent of the world's population living in the developed world, its impacts will be particularly felt in the island states of the South. This is characteristic of one of the other historical traits of the Caribbean—its vulnerability to outside influence.

This decline in the state of the natural resource base has been paralleled by a drop in standards of living and by rapid increases in population in a number of countries. In the past two decades, several Caribbean countries have experienced steep drops in per capita income. Demographic trends show that this trend is likely to worsen, with the working-age population likely to double by the year 2000.

This raises the question of whether it is possible to provide the nearly six per cent increase in growth needed to meet the basic needs of this expanding population without crossing major natural thresholds, which will in turn threaten the prospects for further development.

The Conference concluded that it should be possible to have growth on that scale without destroying the natural environment, but it would have to be a new kind of growth.

This new type of developmental pattern would have a number of characteristics that distinguish it from the present. It would require that the region begin to live off the interest on its stock of ecological capital, instead of running down its stock of natural resources. It would require that countries base their development on policies and projects on a solid analysis of the natural resource base and that they reject projects, including those offered by foreign donors, that do not meet these criteria.

Most important of all, sustainable development requires policies that integrate economic decision-making and the environment. These include not only new tools for macroeconomic analysis and fiscal policy formulation, but also the reorganization of many of the institutions of government in order to enable comprehensive planning of the total stock of physical and human resources. The region can no longer afford uncoordinated policies of economic management on the one hand and natural resources management on the other.

Sustainable development also carries with it a strategic imperative to involve people in the developmental process and the recognition that culture is a precondition of development and

progress. This not only requires new forms of political participation through public consultations on developmental plans and environmental impact assessments, but also much more openness both within and between governments. It also places a premium on the development of the region's total human resources. Special attention must be given to providing opportunities for involving women, youth and the labour force in decisions affecting their lives.

The conference recognized that sustainable development is ultimately a global imperative that cannot be achieved while the developing world is repaying annually over $50 billion more to the rich countries than it receives back in capital imports. The Caribbean region became a net exporter of capital in 1987. The resulting poverty in the developing world and the increasing affluence of the North both contribute to the unsustainability of the current patterns of development.

There are, however, some signs that the new-found environmental concern in the North is bringing about some realization of the interdependence between North and South resulting from our reliance on the planetary ecosystem. International and bilateral foreign assistance agencies are beginning to make some modest resources available for environmental projects and to cover some of the additional costs of making more conventional projects environmentally sound. The region should move to take advantage of these new funds. Far more significant new sources of financial resources could emerge as the world begins to cope with the need to slow down the onset of climate change. Developing countries as a whole, and the region in particular, should use the leverage created by this global concern to extract concessions on issues that particularly concern them in exchange for their efforts to reduce emissions of greenhouse gases and to utilize substitutes for CFCs.

THE CHALLENGE OF SUSTAINABLE DEVELOPMENT

National Policy Considerations

- Countries should move to integrate environmental concerns into the "complete developmental cycle". This requires that the environment become one of the priority items considered by Ministers of Finance and Development Planning along with jobs, export growth and the like in making fiscal and investment decisions. This will require the development of new tools of economic analysis and planning:

- the incorporation of the value of natural resources into the national accounts of at least some countries;
- the comprehensive re-examination of fiscal policies to eliminate those incentives and subsidies that are presently contributing to the unsustainable exploitation of the natural resource base;
- the development of economic policy frameworks that would explicitly recognize the relationships between the human and the natural environments;
- the development of better data and planning techniques to ensure the integration of sustainable development into the developmental cycle;
- the development of new techniques for cost/benefit analysis that would explicitly recognize the need to eliminate the present reliance on discount rates that systematically discount the future and penalize generations yet to come;
- the application of environmental impact assessments to all major public and private-sector, investment projects. These EIAs would be published and discussed with all of those who would be affected by the project.

- The need for a concentrated focus on poverty and the enfranchisement of the poor as a precondition for sustainable development.
- Legislative and administrative mandates must be changed to promote the development of institutions and policies that are truly cross-sectoral and that encourage integrated resource management. These must be given support at the highest political levels in order to overcome entrenched bureaucratic resistance.
- Both research and development and human resource developmental policies should concentrate on this integrated approach to environment and economics.
- Countries must begin to take action now on practical solutions to many of the most obvious cases of natural resource degradation. It was strongly recommended that projects, even on a pilot basis, should be initiated in a number of countries to reforest critical, degraded watersheds, halt the spread of soil erosion and to restore beaches and marine habitats. Governments should demonstrate their commitment to these efforts by providing financial resources of their own and not by relying exclusively on external agencies.

Regional Considerations

- The geography of the Caribbean and the nature of the environmental hazards are such that any strategy for sustainable development must cut across the linguistic, cultural, political and other artificial barriers and encompass all the countries of the Basin. This implies the strengthening of regional institutions, leading ultimately to Caribbean economic integration. Preliminary steps could include the commitment of support for strategic planning throughout the region by removing many of the bureaucratic and political "turf" obstacles and by supporting the development of a regional strategy for sustainable development characterized by the pooling of resources.
- There are a number of needs that must be addressed regionally either by one institution or a series of interrelated institutions. These include:

  - the need for a regional institutional forum—it was suggested that the CARICOM Forum, suitably strengthened, could perform this function;
  - the need for a mechanism that would tie economic policy to environmental policy throughout the region;
  - the need for an institution that could provide advisory services on water, wastes, energy, agricultural chemicals, et al;
  - the need for a greater coordination among Caribbean NGOs interested and involved in the developmental process.

International Initiatives

- Climate and global change will affect the Caribbean very seriously, despite the region's minor contribution to the causes of global warming. These issues are now the subject of a series of international meetings and consultations, beginning with the ozone layer in London in June, continuing through the World Climate Conference in November and culminating in the United Nations Conference on Environment and Development in Brazil in 1992. The Caribbean must play a strong and united part in these discussions, which should aim both to limit the effects of climate change and to provide assistance to developing countries to move to more sustainable forms of energy use.

NATURAL RESOURCES MANAGEMENT

Land and freshwater are critically scarce resources in most Caribbean countries. Yet, many current economic activities are intensive in their use of these scarce resources. In addition, pressures on marginal lands are increasing rapidly. Both land and water rights need to be re-examined in the light of scarcity. Private land ownership does not give the owner the right to misuse or underuse the land. Similarly, riparian or other water rights developed in an era of abundance have now become a problem in an age of scarcity.

In addition to their major direct benefits, forestry resources play important indirect roles in the national and regional economies and in the protection of the environment. These include providing wildlife habitat, climatic amelioration, protection of soil and watersheds, and the provision of wood fuel and charcoal. There is an urgent need to quantify these benefits in economic terms.

Land and water resources are subject both to a range of regulatory agencies and a multiplicity of laws that govern them. There is a lack of coordination and often even conflict among these. There is also a lack of integrated planning, which exacerbates the already difficult situation of most urban municipalities in the region.

Urban management is a critical and under-recognized element of environmental policy in the Caribbean. The major issues identified here are those of population growth and the lack of suitable land for urban expansion, particularly for housing for the poor. Existing planning efforts are frequently frustrated by what several delegates referred to as "political override."

The threat of climate change could dramatically increase the pressure on land and water resources. Rainfall patterns could be seriously disrupted, which would lead to increased flooding in some places and aridity in others. Competition between urban and agricultural users of water will intensify. There is a suspicion that global warming may lead to an increased frequency and intensity of hurricanes.

National Policy Considerations

- Forest policy would benefit from the preparation of national forestry plans that include a balance between conservation and production considerations. Such plans should include measures to promote reforestation of critical watersheds as an urgent priority as well as the development and dissemination of new techniques for agroforestry and measures to arrest the degradation of mangrove forests.

- Agricultural and forestry policies must be blended not only in the area of agroforestry, but in the development of policies that would prevent uncontrolled grazing and the expansion of illegal squatting activities.
- Mechanisms for the rational allocation of water to competing uses must be developed as a high priority. National and regional water resources institutions will need to be re-organized, rationalized and strengthened.
- Countries need to design achievable urban, developmental standards and guidelines for infrastructure and construction that result in developmental projects that speak to the needs of the poor and can be financed from internal resources. Concurrently, people must be trained to understand the impact of their actions on the environment, and to take corrective actions.
- Land reform, designed to reduce the pressure on lands, especially marginal lands and ecologically critical areas, and to promote sustainable usage must be given high priority and the requisite political and fiscal support.
- The urban institutional framework in most Caribbean countries needs to be rationalized so that scarce professional and technical skills may be more effectively used.

Regional Considerations

- A water resources management information system should be developed as a management tool to provide a data base that can assist in the implementation of an early-warning system, investment planning and management.
- Current forestry initiatives, including the Tropical Forest Action Plan, should be accelerated and provided with the necessary resources for effective implementation.

MARINE AND COASTAL RESOURCES

As mainly small islands and with the implementation of the 200-mile EEZ, the marine and coastal areas now constitute the overwhelming proportion of the resources of Caribbean states. The actual and potential role and contribution of the coastal zone to national development should, therefore, be given increased recognition. A more integrated approach to coastal zone development and management is required.

National Policy Considerations

- Increased attention must be accorded to assessing the carrying capacity of the natural resource base to support developmental activities. Understanding the carrying capacity could assist in determining which uses and what kinds of development can be undertaken and managed on a sustainable basis. This can provide the context for rational planning, development and management.
- Assessment of the contribution of tourism to economic development should include costs imposed on the natural resource base, as well as socio-cultural costs and benefits.
- Small-scale, community-based fisheries development and management should be tested for its potential contribution to economic, social and other development. The contribution of human resources should be given a higher profile in achieving developmental objectives, particularly in the fisheries sector. Advantages may include reduced administration costs and the employment of knowledge gained from experience passed on from generation to generation.
- Tourism development need not further tax the coastal zone, and some types of tourism development may be better situated inland, rather than in coastal zones. There is more to offer than sun, sea and sand. However, this does not imply that inappropriate unsustainable activities/actions of the past should be transferred or applied to new/different resources or zones.
- Beach areas should remain accessible for both local and tourist groups.
- Tourists should be informed of the impacts of their activities on local resources, and should be encouraged to support activities that protect, maintain and enhance these resources. Tourism should pay its fair share to protect, maintain and enhance the resources upon which it is based. In addition, means for generating income by pursuing these objectives should be explored.
- New and existing incentives should be explored, assessed and utilized to ensure resource user groups undertake environmentally sustainable development activities.

Regional Considerations

- Underutilized and/or non-traditional resources, such as some fish species, should be examined for their potential to contribute to development needs/objectives.

- Assessment of emerging popular tourism uses/attractions, such as scuba diving and cruise shipping, should be undertaken in light of their impacts on the resources upon which they depend.
- A regionally consistent and proactive approach is required to ensure developmental activities, particularly in the areas of tourism and fisheries, do not lead to excessive competition and depletion of vital resources for the sake of short-term economic return at the national level. Regionally consistent rents/rates for the utilization of resource products should be charged.
- More information and appropriate data are required to identify available options and to support informed decision making regarding resource development and management. Although a large number of studies have been undertaken and reports prepared, information sharing was not yet a high priority. It was noted that many useful studies/reports are not available for general distribution.
- The need for a new regional institution focusing on the environment and sustainable development was not felt to be a priority. Existing institutions should be strengthened, building upon what has already been established. There is room for changing the scope and focus of existing institutions through maintaining flexibility in design and function.

PRODUCTION, PROCESSING AND CONSUMPTION OF NATURAL RESOURCES

The region suffers from the low status of science and technology, due largely to a misconception of the role of science and technology in development and to the absence of the mechanisms required to produce technological instruments from scientific knowledge.

Pollution and energy problems stem largely from the low efficiency of production and the impacts of wastes.

The private sector in the region has been slow to develop a proactive stance on the environment and sustainable development and has tended to adopt a defensive posture in this area.

Regional Considerations

- Better waste management policies are required and should be based on the following strategies, in order of preference:

    . avoid as much as possible the generation of wastes in the production process;

. improve production efficiency;
. promote waste recycling and treatment.

- Two main categories of measures are available to improve waste management; namely, regulatory measures and the use of tax incentives, tradable emissions and other tools to alter the market signals. Each country should adopt an appropriate mix of both to suit their particular social, cultural and political contexts.
- Waste management programs require both information production and dissemination, through formal and non-formal means of communication, as well as technological innovations through research, development and demonstration.
- Caribbean governments must develop clearer policies regarding the importation of technology. In this regard, they need to develop better negotiating abilities and to begin to reject inappropriate projects and policies offered by donor agencies.
- In order to prevent the growth of "pollution havens" and to prevent investors from playing one country off against another, the governments of the region should move to harmonize their norms and standards for waste management, environmental impact assessment and the like.
- Indigenous research and development programs and activities must be strengthened so that they have a better linkage with production. They must be focused on real opportunities for technological development that is sustainable, and must lead to innovation.
- The private sector must move to a proactive approach to waste management. It must join the move away from end-of-pipe technology to waste reduction. Private-sector enterprises should move to help universities and other human resource developmental institutions to promote research and development aimed at strengthening the technological base of waste reduction methods and at developing engineering curricula that emphasize environmental and public health protection as integral factors in industrial plant design and operation. As part of this pro-active approach, industries should establish effective community outreach and involvement programs.
- Private enterprises should move to produce public environmental impact assessments of their major new investment decisions. Those international institutions and domestic public-sector institutions that provide capital for the private sector should insist on the preparation of adequate assessments as a precondition for the provision of the capital.

HUMAN RESOURCES DEVELOPMENT

Without exception, speakers and discussants on this and other issues stressed that sustainable forms of development for all segments of society—governments, national and international non-governmental groups, environmentalists, population control advocates, tribal peoples, organized and informal labour, women, local communities and private entrepreneurs—must be underpinned by a primary concern for a respectable quality of life for all people.

It was stressed time and again that unsustainable developments stem from the extremes of wealth and poverty, nationally and internationally, generated by the exploitation of both natural resources and the poor. Until the wellbeing and dignity of the poor is achieved, conserving and rehabilitating the environment will, and should, remain a secondary developmental priority. This is as true for the urban poor as for those who eke out a living from the natural resource base in rural areas.

The sustainable development concept challenges labour and management to adopt a joint problem-solving approach to the process of collective bargaining. It also challenges labour unions to lobby and champion for the interests and survival concerns of the women, unorganized labour and the disadvantaged.

The integration of the environment and economics in decision-making demands a multidisciplinary planning and management competence that few, if any, programs currently support.

National Policy Considerations

- Many environmental issues stem from the application of science and technologies developed to promote rapid growth and industrialization without consideration for their impact on all segments of society. Early action is required:

  to examine, and restructure as necessary, education, science and technology, and management policies and practices to ensure that they respect and support social and cultural values and militate against the environmentally damaging excesses of wealth and poverty;
  by governments, institutions of higher education, training institutes and the private sector to guard against, and even reject, adopting or accepting support for approaches to development that are incompatible with societal needs.
- Governments and industry must welcome and encourage communities and non-governmental organizations in the design

and implementation of developmental initiatives that are fair to both society and the environment.

- Some suggested that policies that have the effect of slowing the rate of population growth are the most attractive means of buying time in the search for solutions to environmental problems.

Regional Considerations

- Academic and professional educational programs that focus on integrated natural resources management and development are required. These should be designed on a regional basis and administered through a network of inter-institutional accreditations that involves institutions devoted to higher education, technical training and extension services.

PART I

The Challenge of Sustainable Development

Part I — The Challenge of Sustainable Development

Introduction

Economic and ecological systems are totally interlocked in the real world, but they remain almost totally divorced in our institutions. In the Caribbean region, sustainable development depends on the effective maintenance of diverse and fragile ecosystems. The real world will not change: attitudes, institutions and policies that shape the development process must.

In opening the Conference on the Public Policy Implications of Sustainable Development in the Caribbean Region, the Deputy Prime Minister of Jamaica, the Honourable P. J. Patterson, described sustainable development as a matter of "life or death" for a natural resource-dependent area such as the Caribbean. From a national perspective, the development prospects for all the countries are dependent upon the protection, preservation and enhancement of their diverse ecosystems. Deputy Prime Minister Patterson also noted that, from a regional standpoint, development and the environment are interlinked, as exemplified by the following:

- "our reliance on tourism increases our concern for our beaches and protection of marine life;
- our tourism product would be adversely affected by a major oil spill occurring in any of our waters;
- our fishing potential is capable of joint exploitation;
- we are all susceptible to phenomenon like global warming as well as hurricanes, earthquakes and volcanoes;
- our respective countries are subject to the twin ravages of droughts and floods."

Part I — The Challenge of Sustainable Development

Introduction

Economic and ecological systems are totally interlocked in the real world, but they remain almost totally divorced in our institutions. In the Caribbean region, sustainable development depends on the effective maintenance of diverse and fragile ecosystems. The real world will not change: attitudes, institutions and policies that shape the development process must.

In opening the Conference on the Public Policy Implications of Sustainable Development in the Caribbean Region, the Deputy Prime Minister of Jamaica, the Honourable P. J. Patterson, described sustainable development as a matter of "life or death" for a natural resource-dependent area such as the Caribbean. From a national perspective, the development prospects for all the countries are dependent upon the protection, preservation and enhancement of their diverse ecosystems. Deputy Prime Minister Patterson also noted that, from a regional standpoint, development and the environment are interlinked, as exemplified by the following:

- "our reliance on tourism increases our concern for our beaches and protection of marine life;
- our tourism product would be adversely affected by a major oil spill occurring in any of our waters;
- our fishing potential is capable of joint exploitation;
- we are all susceptible to phenomenon like global warming as well as hurricanes, earthquakes and volcanoes;
- our respective countries are subject to the twin ravages of droughts and floods."

This current and prospective situation led the Deputy Prime Minister to stress that,

> ". . . in matters concerning the environment and economic development, we must proceed as an army marching to the same drum. But we must make sure that the drum is beating loud enough to be heard and not so slow that we fall asleep between steps. . . . To be effective in realizing the full benefits of the current changes in the global economy, Jamaica, like the rest of the Caribbean, will increasingly have to act through regional bodies such as the Caribbean Common Market (CARICOM). To this end, the Government of Jamaica is fully committed to the full development of CARICOM leading ultimately to Caribbean economic integration."

The Environment and Development Challenge

The World Commission on Environment and Development—the so-called Brundtland Commission—concluded in its final report, "Our Common Future," that the state of the planet's environmental health is bad and rapidly getting worse. Global warming, deforestation, desertification, soil erosion, the release of toxic chemicals, contamination of the food chain, the loss of biological diversity all commanded the Commission's attention. The Commission also pointed out that many parts of the world have already crossed critical natural thresholds.

Despite this concern over the state of the world's environment, the Commission recognized that if the world population doubles to 10 billion over the next half-century, a 5 to 10 fold expansion of the world economy would be needed to enable that population to meet its minimum needs and aspirations. An expansion on this scale, employing present development and resource-use patterns, is clearly at odds with environmental imperatives.

The Caribbean is a microcosm of this environmental and developmental global situation. Natural resource intensity, often in products designed for export, has historically been one of the main features of productive activity in the region. Agriculture, forestry, fishing and, above all, tourism all depend for their economic success on a healthy and productive environment.

Yet there is ample evidence throughout the region that the environment is in trouble. In Jamaica alone, the deforestation rate is 3.3 per cent per annum, and is among the highest in the world. Soil erosion is stripping the productive highlands and leading to siltation of some of the region's coral reefs and elimination of critical

fish habitat. Both surface and underground water supplies are under pressure because of over use and are subject to pollution.

This decline in the state of the natural resource base has been paralleled by a drop in standards of living and by rapid increases in population in a number of countries. In the past two decades, several Caribbean countries have experienced steep drops in per capita income. Demographic trends show that this is likely to worsen, with the working age population likely to double by the year 2000.

This raises the question of whether it is possible to provide the nearly six per cent increase in growth needed to meet the basic needs of this expanding population without crossing natural thresholds that, in turn, threaten prospects for further development. As Helen McBain put it:

> "The question that needs to be asked is whether it is still possible for Caribbean countries to achieve sustained growth in the present period given constraints such as resources limitations, slow growth in the world economy, trade protectionism and the food-aid policies of developed countries.
>
> "Governments in the region may opt to stay on the same highly dependent path because of financial constraints and the political cost of economic transformation. In such a scenario, the type of economic growth pursued would not be sustainable in the long term unless the natural resources on which such growth is based are effectively managed. The option of pursuing a more self-sustained path of economic growth is a more difficult one given past performance and commitment, but is ultimately more rewarding in terms of reducing dependence and improving the welfare of the population. Management of natural resources would still have to be pursued, but this would be less difficult through an integrated approach to economic growth and development.
>
> "A more sustained path to growth based on domestically integrated economies may not be feasible for every Caribbean country, and therefore regional integration (at OECS and CARICOM levels) has to be pursued to ensure an integrated regional economy with individual economies and sectors providing impetus to other economies and sectors in the regional economy. The move toward economic blocs in the world economy makes this a

necessary condition for achieving a path to more sustained growth and development."

In subsequent discussions, it was concluded that it should be possible to have growth on the scale required without destroying the natural environment, but it would have to be a new kind of growth. This parallels the global position adopted by the Brundtland Commission. The Commission noted that earlier environmental and developmental debates had concentrated almost exclusively on the "tail-end" of the development cycle, on the harmful effects of economic growth, and on ways to ameliorate these effects. The Commission's analysis asserted that this focus will no longer do. The steady depletion of the earth's natural capital is becoming a major constraint on economic growth, and a major threat to national security and survival. An essentially closed natural system is being pressed against some of its limits by an essentially open economic system.

The new agenda prescribed by the Commission expands the focus to include the "front end" of the development cycle. It makes the environment a mainstream, economic issue of critical concern to the central economic, trade and spending agencies of government and to foreign ministries and development assistance agencies. It becomes an issue of central concern in the boardrooms of major corporations. This is not to say that Ministries of the Environment should not continue to have a critical role to play, nor that they should not be strengthened with new resources—human, financial and technological—to play that role effectively. It is to say that Ministries of Finance and Development Planning, of Agriculture, Energy, and Trade must consider the environment, along with growth, employment, export prospects, regional development and the like, when they develop their policies and prepare their budgets. For under the new agenda, the national budget, not the state of the environment report, becomes the government's most important annual, environmental statement.

Even though the notion of linking a government's commitment to the environment to its annual budget statement was considered valid, the point was stressed time and again that sustainable development as a global imperative cannot be achieved while the developing world is repaying annually over U.S. $50 billion more to rich countries than it receives back in capital imports. In this context, it was noted the Caribbean region became a net exporter of capital to the industrialized world in 1987. The resulting poverty in the developing world and the increasing affluence of the North both contribute to the unsustainability of current development patterns.

It was recognized, however, that there are some signs that recent environmental concern in the North is bringing about some

realization of the interdependence between North and South, which results from a common reliance on the planetary ecosystem. New approaches to debt financing are being examined, and international and bilateral foreign assistance agencies are beginning to make modest resources available for environmental projects and to cover some of the additional costs of making more conventional projects environmentally sound. The region should move to take advantage of these funds and to prepare for the far more significant new sources of financial resources that could emerge as the world begins to cope with the need to slow down the onset of climate change. Developing countries as a whole, and the Caribbean region in particular, should use the leverage created by this global concern to extract concessions in exchange for their efforts to both promote more sustainable forms of development within the region and to reduce emissions of greenhouse gases and to utilize substitutes for chlorofluorocarbons (CFCs).

The Political and Institutional Challenge

While most world leaders have publicly accepted the need for the new agenda, its application will not be easy, if for no other reason than it requires a totally new type of leadership ethos. As Jim MacNeill noted,

> "The Commission found that in most countries, government interventions in the market—through subsidies, grants, price controls, tax abatements, you name it—actively encourage air and water pollution, soil loss, deforestation and species loss, and degradation of coastal areas. These interventions are often backed by enormous budgets and, consequently, they are more powerful than any conceivable measures to protect environments or to restore and rehabilitate those already damaged.
>
> "Western agriculture and agricultural trade policies provide a good example. The 24 member governments of the Organization for Economic Cooperation and Development (OECD) now spend over U.S. $300 billion a year on agricultural subsidies that not only distort trade and are economically perverse and ecologically destructive. The Commission also found that the wall of protectionism surrounding western agriculture, and the dumping of surpluses at subsidized prices in developing countries, undermines domestic political pressures to reform their

own agricultural policies, many of which are equally perverse.

"A lot of the stories we read about deforestation seem to suggest that it's sort of inevitable—almost an act of God. Well, it's not; most often it's a direct consequence of government policies. The Commission found that government policy cupboards everywhere are full of incentives to overcut the world's forests. Brazilian taxpayers have been underwriting the destruction of the Amazon to the tune of hundreds of millions a year in tax abatements for uneconomic enterprises. American taxpayers are subsidizing the clearing of the Tongass, the last great rain forest in Alaska.

"If these incentives remain in place, it is very doubtful that the world's remaining forests will survive. But removing them will not be easy."

Mr. Roderick Rainford, Secretary-General of CARICOM, reinforced this political and institutional challenge from a Caribbean perspective.

". . . at the very heart of sustainable development is the question of how we do things; how we interact with one another and with the physical world around us; how we consciously plan to so interact; how we anticipate consequences and consciously let these consequences affect our interaction. From a sustainable development perspective, the issue is, therefore, the creation of a relevant paradigm for planning and action that becomes almost second nature (which historically is what most paradigms have become), and that harmonizes our developmental interaction with the earth's natural rhythm and inexorable evolution to whatever its ultimate destiny is in the life of the universe.

"Such a paradigm could entail not only the planning and action that are needed, but also the mode and structure of the procedures for planning and action. If this sounds like a plea for bureaucracy, the only thing I can say is that while we are conscious of the deadening inertia that bureaucracies can sometimes generate, at the same time I do not know of an entity in history, whether in the private or public sector, that has been able to pursue sustained and organized action without a bureau. It is not a

question, therefore, of whether or not there is a bureaucracy, but rather it's a question of the ethos that pervades a given bureaucracy."

Helen McBain addressed the challenge of a new paradigm for planning and a new ethos for planning by offering an integrated development planning model as a framework for sustainable growth this way,

". . . Preoccupation with raising the investment rate, through attracting foreign capital, among other things, precluded consideration of other measures, such as increasing efficiency, human resource development, land reform, effective management of natural resources (e.g., rational land-use policies and greater linkages between economic sectors such as food-producing and the tourism sub-sectors), that could increase output and income.

"A change of emphasis from capital to other resources, in particular human resources, would require different models that would specify the relations between a different mix of variables. It would also require an adequate database. The challenge for development planners and technicians is to construct such models and to quantify variables that have hitherto been excluded from modelling and planning exercises. This would form the basis for integrated development planning aimed at a more sustainable growth and development process. It would also imply including environmentalists, agronomists, energy specialists and others in the composition of planning institutions. The planning process would also have to be democratized to include inputs from persons in both the public and private sectors. This could be done through the mechanisms of taskforces and public meetings, which are presently being employed by Jamaica in putting together its development plan for the 1990s.

"Since development plans are based on projects, project planning as an aspect of development planning should also involve planners of varying specializations. Line ministries, which are usually responsible for developing projects that fall within their area of responsibility, do not have the requisite skills in their planning divisions where these exist, and therefore need to consult with other ministries and agencies in order to facilitate rational sectoral plans and projects. The challenge is for

> Caribbean governments to move away from the present compartmentalized approach to planning and adopt policy coordination at both the planning and implementation levels."

While there was general agreement that the shift to more sustainable forms of development within and between the countries of the Caribbean required an improved approach to planning and development, it was forcefully stressed that an underlying priority was the need for many existing institutions and the institutional framework at both the national and regional levels to be rationalized. Many participants argued that by eliminating duplication and waste, not only could more effective use be made of the skilled personnel currently practicing in the region, but such "realignments" would go a long way in dealing with the persistent and endemic public sector employment issues of inadequate remuneration, accountability and commitment. It was further suggested that consideration be given to establishing a regional pool of personnel skilled, in both policy development and project implementation, which could be tapped by governments and others for specific assignments.

Throughout the discussions on a new agenda for growth and on the need for fundamental institutional and personnel realignments, two areas were frequently highlighted for priority attention. First, was overcoming the present ideologies of institutions and bureaucracies that tend to either resist change, accommodate change through "empire-building," or both. Second, was the dynamic of "political override," which often results in confusing signals being sent to officials and professionals responsible for advising on the management process. It was asserted that these issues—frequently aided and abetted by the practices and philosophies of international financial institutions, aid agencies and foreign entrepreneurs whose representatives enjoy ready access to high political levels—were impeding both a shift to more sustainable forms of development and the required leadership for institutional and planning reforms. The following observations by Helen McBain provide an example that reflects these concerns.

> "In the Caribbean, food aid comes primarily from the United States, the European Community and Canada and mainly in the form of milk and cereals. Because of the low cost of these items and the political gains to be made from providing electorates with cheap food, governments have not seriously pursued agrarian reform. The availability of subsidized items such as milk, rice and corn suppresses producer prices and, hence, provides a disincentive for import substitution, as evidenced by the

Jamaican experience during the 1980s. Foreign aid to the region has also been targeted at production of cash crops in commercial and capital-intensive operations, rather than at projects that would directly improve the conditions of the rural poor. Again, aid donors have been more concerned with assisting agricultural production that could benefit their economies, rather than the economies of the less-developed countries.

"Although food aid is still distributed, the emphasis by aid agencies has shifted to structural adjustment lending. . . . Structural adjustment programs in the Caribbean have not promoted greater internal economic integration through increased linkages between industries and sectors, but have reinforced the disarticulated mode of production that has been the feature of these economies.

"This pattern of assistance, which was also geared toward ensuring that less-developed countries could service their foreign debt, places undue stress on projects and programs aimed at structural change. For example, the Jamaican government's agricultural diversification program of the 1980s supported by the World Bank and the United States Agency For International Development (USAID), was hastily conceived and executed largely because of the need to achieve results in a short space of time, and to earn foreign exchange for servicing the debt and satisfying other requirements."

The point was made time and again that international agencies must be made to recognize the unsustainability of economic growth based on some of the projects and programs they are supporting—and that are often conceived and designed by foreign nationals who have little understanding of, or empathy for, the region. A more fruitful approach would be for donor agencies to exhibit a greater willingness to support the establishment of a local capacity to develop programs and projects that will stimulate sustainable growth—even though this growth may not be geared toward increasing exports and debt financing in the short or medium-term. Several participants argued that Caribbean governments should be unwilling to accept donor funds that are not in accord with their longer-term development interests, even if this ultimately leads to defaulting on their debt.

It was also noted that western countries, which are historically responsible for environmental degradation, have failed to provide leadership in addressing the sustainable development challenge.

> "The industrialized countries are clearly responsible for the lion's share of the world's pollution—about 80 per cent—and, I would guess they are responsible for about the same proportion of the rapid depletion of the earth's ecological capital. Even though much of that depletion occurs in the South. They have a corresponding responsibility to provide the lead in measures to reverse these trends. I must tell you, however, that, in my view, there is very little evidence that the key western governments—in contrast to the majority of their citizens—are as yet prepared to shoulder that responsibility in ways that make a difference." (MacNeill)

Instead of shouldering responsibility for environmental degradation by providing the leadership necessary to move from rhetoric to action, the point was made that the main emphasis of the western world has been to advocate restraint by developing countries in the consumption of resources, and to reinforce this advocacy through the imposition of environmental conditionalities on bilateral and multilateral aid. In this context, it was stressed that the Caribbean, despite its lack of powerful economic leverage, does have, and could use, its political leverage in international forums to press for the reform of domestic and international policies and practices of industrialized countries—including aid.

> "Caribbean countries have an enormous stake in the outcome of future global discussions on sustainable development. Your governments can be highly influential in the councils of nations, and you should not allow your size to deter you in any way from playing a strong role in the negotiations on these issues. You may be small in terms of geography and population; your contribution to global warming, deforestation and other syndromes may be equally small in the aggregate; but your stake in measures to limit them could be survival itself." (MacNeill)

The importance to the Caribbean of conveying and acting from a regional perspective in international forums was reinforced by Roderick Rainford, Secretary-General of CARICOM.

> ". . . the sustainable development goals and needs of people within our communities in the Caribbean are closely affected by factors that call for global and international management. . . . Notwithstanding different interpretations of the available evidence among the

scientific gurus, the issue of climate change is an ominous cloud on the horizon, in that it portends the impact of sea-level rise on low-lying areas and of more frequent and more intense hurricanes in the Caribbean and elsewhere. The implications of faultily designed and badly operated nuclear reactors are also of direct concern to our sustainable development. These threats do not arise from anything we in the Caribbean are doing or are not doing within our boundaries, yet they directly affect our lives directly. Can we wait passively to be affected? We need not look further than the old tried and tested English Common Law principle that if you are affected on your property by a nuisance that stems from action taking place on somebody else's property, you have a right to have the nuisance abated or to sue for damages, or both. We know that the principles of municipal law become very attenuated at the international level, but it is clear that part of the challenge we face . . . is organizing ourselves to shape an effective voice in the Caribbean and to join with others in the global community with similar concerns to press for credible international norms and mechanisms that will address threats to our sustainable development and that can only be effectively managed and controlled on a global basis."

The Economics of Sustainable Development

To a significant extent, a country's development history is built on a framework of values, assumptions, incentives and disincentives that are built into political, economic and social structures. For example, at a particular point in a country's development, emphasis might be placed on a rapid accumulation of material resources. Later it might shift to income distribution favourable to the poor, educational policy to raise the productivity of unskilled labour, measures that address the trade and technological dimensions of growth, or any other of a series of socio-economic themes. In each case, the system of public policy interventions through subsidies, grants, tax regimes, price controls and the like is designed to reflect the prevailing dominant development themes. As Donna McFarlane-Gregory noted in her overview of the Jamaica economy,

"With specific reference to Jamaica, we have moved from a mono-crop, plantation economy with sugar as the mainstay, to a multi-crop, import substitution-based economy, and then to export-led development, ending up in

> many respects with some mixture of both. At one or more of these stages of economic development we have emphasized a combination of (socio-economic) themes. . . . In 1974, the Government of Jamaica enunciated Democratic Socialism as the political principle upon which economic policy would be forged, as a means of speaking specifically to gross inequities in income and land distribution, as well as enhancing the overall participation of the majority of Jamaicans in the formal economy of the economy. This meant that the government entered the marketplace as a producer of goods, deliverer of services, and employer of non-civil servants—production workers."

However, as noted earlier, the World Commission on Environment and Development found that in most countries, these types of government interventions in the market frequently encourage unsustainable forms of development, since they fail to correctly allocate the cost of sustaining the environment. This was reinforced from a Caribbean perspective by Norman Girvan in opening the debate on the economics of sustainable development.

> "In the Caribbean, environmental issues have so far been a stranger to both the theory and practice of economics. . . . One reason for this is that the basic paradigm of economics excludes consideration of the interaction between the human economic system and the wider ecosystem of which it is a part. . . . Another reason is that the attention and energy of economic technocrats are absorbed by the demands of short-term economic management (balance of payments, debt, adjustment). Environment is regarded as a long-term problem, or of greater concern to the developed countries, or to a specific group called 'environmentalists'. . . .
>
> "A root cause, in my view, is the tyranny of the ideology of gross national product (GNP) growth. Progress is equated with indefinite accumulation of material artifacts, and the environment is assumed to be infinitely capable of supporting this, with the help of (suitably perennial) advances in science and technology. . . .
>
> "The neglect of the environment in Caribbean economics stands in sharp contrast to the extreme degree of environmental sensitivity of Caribbean economies. Natural resource intensity is, and has historically been, an

outstanding feature of productive activity in this part of the world."

The paper prepared by Delisle Worrell and Keith Worrell further reinforced this perspective with a graphic view on current trends.

> "In the Caribbean, the sustainability of current patterns of economic development is clearly in question, on purely economic grounds, as consumption and aspirations constantly run ahead of productivity; on social grounds, as an invasion of alien processes and lifestyles threaten to inundate and obliterate the characteristic cultural practices of the region; and on environmental and aesthetic grounds, as economic growth defaces the landscape, degrades water supplies, decimates marine life and generates mountains of waste product."

However, the fact that economics and traditional economic techniques have failed to address market failure associated with environmental impacts are, Girvan went on,

> ". . . not grounds for inaction. The environment is one area where it can probably be said without fear of contradiction that some action is better than no action at all (although all actions can be ranked according to their cost-effectiveness).
>
> "The state can give a lead in helping the market function better by taking steps to reflect environmental costs and benefits in its macro and microeconomic interventions. . . .
>
> - Governments should adopt a parallel system of national accounting that accounts for the depletion of non-renewable resources, and the degradation of the environment, as a cost of generating the national income. The very effort to collect the necessary information and to value these costs will constitute an educational exercise for technocrats, politicians, and the general public. For a start, the exercise could be undertaken by one or two (CARICOM) governments on an experimental basis, and biannually.
> - All major investment projects undertaken, sponsored or promoted by the public sector should have a comprehensive Environmental Impact Assessment (EIA) undertaken as a requirement. This EIA should

normally involve an independent team of local/regional researchers, with foreign collaboration where necessary, thereby building up a local/regional environmental assessment capability through 'learning by doing.' The EIA should be made public before the investment project is finalized and approved, and should be discussed with all communities and parties likely to be affected by the project, as well as with relevant professionals. These discussions should be regarded by the government/investment agency as one of the feedback mechanisms for modifying the design of the project.

- Where feasible, the EIA should be used as the basis for computing environmental costs and benefits and should be included in an Extended Cost-Benefit analysis that would be used to evaluate the project."

These suggestions were expanded in subsequent discussions. There was not only strong support for the development of a system of environmental accounts, but there was also a call for the development of sustainable development indicators (qualitative and quantitative) appropriate to the Caribbean region. The point was also made that existing public policy incentive and disincentive regimes need to be assessed in the context of sustainable development criteria. This is a crucial step, as it is difficult to create the future when the present is not well understood.

With respect to EIAs, there was broad consensus they should be mandatory for both public and private-sector initiatives—not just for those projects being undertaken by, or with support from, the public sector. The need for independent evaluations, with public participation, was also stressed—the point being made was that an EIA should not only be of benefit to investors as a means for constructively responding to public concerns, but can frequently lead to the identification of new opportunities. A plea was also made by some participants, for the International Finance Corporation (IFC) to insist on environmental assessments in its dealings with foreign investors operating in the Caribbean, in the same way the World Bank deals with governments and government projects.

A related issue concerns the regime of environmental norms and standards that is applied to investment proposals throughout the Caribbean. It was stressed that some form of uniformity is required among countries of the region to help offset the current practice of investment being "peddled" from one country to another, or taken from one country for reinvestment in another that has less stringent standards.

Two other issues that were frequently raised relate to the dichotomy between the "in perpetuity" time-scale implicit in the sustainable development concept and the reluctance (or weakness) of political and economic systems to take the long-term view. From a capital investment perspective, the point was made that the current planning and investment horizon for most projects is ten years or less. With a discount rate of ten per cent, the present value of a future asset beyond ten years is zero. By bringing in an environmental dimension, this "normal" discounting for time is dramatically changed and poses one of the most severe methodological problems in project analysis.

The same sort of dilemma is true in the political context in which policy decisions are taken. In a political system faced with satisfying short-term needs, limited financial resources, and geared to elections every four or five years, it is brave to make substantial resource and other commitments now that will bear fruit only over a period of several decades. However, through the judicious realignment of government incentives, there are potential opportunities for redirecting financial resources to more sustainable forms of long-term development. As Jim MacNeill noted,

> "If governments must subsidize—and no politician that I have met is likely to give up this proven path to power—they should and could subsidize in ecologically sensible ways. The Commission found that agricultural structures, for example, could be changed in ways that not only maintain farm income, which is clearly essential for sustainable agriculture, but also encourage practices that enhance rather than deplete basic farm capital. Energy incentives can be provided in ways that encourage conservation and end-use efficiency, and that discourage fuels that lead to acid rain and global warming. And so on—at far less cost to the Treasury."

Postscript

The following assessment by Delisle Worrell and Keith Worrell, along with the papers prepared by Ausbert d'Auvergne and Cletus Springer as well as Clive Thomas, capture the sentiment and mood of Conference participants with respect to the key policy, institutional and economic challenges that must be addressed by countries of the Caribbean if they, and the region, are to proceed to more sustainable forms of development.

"The path to sustainable development is defined by society's preferences, by and large. They can be influenced to an extent by prices and taxes, but not fundamentally. Economic structures do affect the value system: the 'triumph' of Western capitalism is largely due to the evident prosperity of Western economies. But changes in the value system cannot be engineered by manipulating economic incentives; rather, the incentive regime is dictated by the underlying value system. Much of the responsibility for charting an alternative path to a genuinely better quality of life is the responsibility of the purveyors of religion, culture and values."

A Politico-Administrative Perspective

Cletus Springer
Ausbert d'Auvergne

I. INTRODUCTION

The characterization of Caribbean countries as being open, dependent and underdeveloped, is not one that will evoke extensive debate. Generally, economies are not sufficiently diversified and self-sustaining. Further, the countries are locked in a cycle of unbalanced import-export orientation. Exports are usually limited to one major crop, and diversification of the export base is restricted by dependence on foreign capital and technology. Imports, on the other hand, are diverse and unlimited, and are accelerating to meet the needs of growing populations.

If we superimpose on this backdrop of "dependent under-development," as V. Lewis calls it, the fragility of our countries' terrestrial and marine ecosystems, we are faced with a very imposing, and sometimes frightening, picture that presents engaging terms of reference for development planners and politicians in particular, and for the institutions and people of the Caribbean in general.

Sustainable development is really a new nomenclature for comprehensive, strategic planning and management of the total resources available to a country. So that, in addressing the subject of the "Institutional Challenges of Sustainable Development," we are referring to the institutional requirements for comprehensive planning and management of the total complement of physical and human resources.

In singling out our political and planning institutions for special attention, we are not suggesting that this is where all future developmental action must take place. Rather, we are expressing a conviction that they are at the root of our problems. It is our thesis

that sustainable development can only be achieved and maintained if we fashion at the political-administrative level a new and meaningful relationship that is based on reaching accord on the most rational approach toward the sustainable utilization of our resources.

In our opinion, this thesis is applicable at the national level as well as at the supra-national level. It is not surprising that the regional dimension should enter any discussion of sustainable development, when you consider the economical and ecological vulnerability of the Caribbean region.

Notwithstanding our claims to sovereignty, we find that our "Exclusive Economic Zones" are more inclusive than exclusive. We have similar physical characteristics, coastal dynamics and climatic features as well, and we share the effects of environmental catastrophies.

Methodology

In the first of the following three sections of this paper, we examine the internalities and externalities that have dictated the unsustainable approach to development in the past. Much of what is stated will not be new to many, but we feel this structure is necessary to establish the constraints to sustainable development so that we may better address how they may be overcome. This is followed by an examination of the institutional environment in which we explore why our institutions have failed. We put forward the view that the developmental paradigm chosen by Caribbean countries is flawed because it is based upon unrealistic assessments of the resources available to the region. As a result, the institutional framework is, for the most part, inappropriate and inadequate. Finally, we offer some responses to the institutional challenges that lie ahead, and suggest policy and resource inputs necessary at the national and regional levels to achieve and maintain the desired results.

The paper does not treat the institutional aspects of sustainable development exhaustively. The approach is not on a sector by sector basis, and some gaps may exist. But it is hoped that, in addressing the politico-administrative element, sufficient ideas are provided to show the way forward.

II. THE DEVELOPMENT/MANAGEMENT ARGUMENTS REVIEWED

The middle-income status that is assigned by the international, financial community to many countries in the Caribbean is belied by the reality of entrenched poverty and deprivation among the majority of the region's six million inhabitants. Unemployment levels as high as 40 per cent exist in some countries, with an even higher level of underemployment among the region's 2.5 million workers. Distressingly, a growing number of people are without basic needs (food, shelter and clothing, and access to essential services; e.g., drinking water, sanitation, transport, health and education), and so are unable to participate meaningfully in the development process.

In this scenario, a distinction is not made between the poor, rural dweller eking out a meagre existence through a "slash and burn" profession in the forest, and the desperate bids of Caribbean governments to stay afloat amid the turbid waters of economic adversity, as they endeavour to provide a decent standard of living for their burgeoning populations.

In making this point, we are not stating anything new. It is a reality that has been with us for some time and it has been amply documented and analyzed by L. Best, G. Beckford, A. Lewis, C. Thomas and others.

Other presenters amplify these issues elsewhere in this publication, when they address the economic challenges of sustainable development. However, it is necessary to restate here, as it provides us with the context in which we may determine our politico-administrative institutions, and assess how they function or malfunction.

It is this reality of dependent underdevelopment that encourages governments and peoples to be reckless in their relationship with the environment, and that inspires one of the strongest impediments to achieving and maintaining a rational approach to the optional use of the resources available.

While not wanting to become immersed in administrative theory, we acknowledge that considerable argument abounds among administrative theorists as to what constitutes the ideal, rational decision-making method. Many models, theories, concepts and schemes have been expounded, including the rational-comprehensive theory, the incremental approach, and the mixed scanning method.

Herbert Simon, in his "behaviour alternative model" states that:

> ". . . in any situation, an administrator ought ideally to examine all possible courses of action open to him, trace through the consequences of each alternative course, then separately evaluate the benefits and losses of each

> alternative. He should then choose that course of action which is expected to provide the greatest net satisfaction. . . ."

An indication of the argument that engulfs the subject of rationality can be gleaned from Simon's own theory of "bounded rationality," in which he postulates ". . . that people seldom attempt to find the best alternative in a decision-making scenario." Rather, he notes, they select a number of "good enough" outcomes and an alternative that is likely to achieve one of them.

Politicians would be among the first to argue "the irrationality of complete rationality." That is to say, it would be irrational to evaluate all alternatives, and then choose the best one, if this would involve the expenditure of vast amounts of time and money.

We take the point that there are limits to the exercise of rationality in decision-making. But the point that is often overlooked is that time and money are not ends in themselves. They are inputs, and the acid test that will determine how effectively they have been managed will be the degree of sustainable development that has been achieved.

At the risk of being overly simplistic, we go on to explain, by example, that it would be unsustainable to save time and money in the short term by approving within two months a major development project in an ecologically sensitive area only to lose millions of cubic yards of top soil within one year of approval because of sediment transport induced by insensitive alteration of the site's ground cover. Similarly, it is patently unsustainable to use scarce foreign exchange reserves (a key determinant of important macro-economic variables such as output, investment, employment, etc.) for importing luxury items and consumer durables for the few who are affluent, while the majority live without the basic necessities of life.

If the preceding arguments seem simplistic and rational, then why have the tenets of rational thinking suggested by them been so consistently ignored by Caribbean governments? Why must hundreds of thousands of dollars be spent on marina projects, for example, that raise the level of pollution introduced to the marine environment more than they impact on the economy of host countries? Why must the coastal resources of the Caribbean be placed so unhesitatingly at the disposal of foreign investors, to literally do as they please, without governments arranging for EIAs to predict the likely adverse impacts of these projects on the geophysical environment?

We do not discount the impact of several contextual factors that are at work, both internally and externally, and that result in desperation on the part of our governments. But shorn of all their institutional trappings, governments are really political parties that thrive on and suffer from the vagaries of the national political

culture, which will, in time, impact on the decision-making culture. It is accepted that there is a close relationship between the level of dependence and underdevelopment of a country and the poverty of its people, as well as on the level of demands that are placed on political institutions.

What is equally important to understand is that the capacity of governments to meet these demands will depend on the capacity of the economic system. The management of these demands, therefore, is critical as countries move from a traditional to a transitional phase of development.

The evidence suggests that political institutions have failed where demands of the populace have been wrongly interpreted, and where the approaches taken to satisfy them have resulted in pathways of development that are unsustainable because there are insufficient resources.

What does all of this have to do with the concept of sustainable development? Let us return to the analogy of the poor rural dweller, and the poor, dependent and underdeveloped state. What is needed is a shift from a management-by-crisis approach to development to a planned, programatic approach, based on the resources available to a country or to a group of countries.

We shall be developing this argument further later in this paper, but we want now to examine the institutional setting, and to determine the adequacy and appropriateness of existing institutions in undertaking the task of sustainable development.

III. THE INSTITUTIONAL SETTING

While mindful of the pitfalls inherent in generalizations, it would not be risky to characterize the approach to development in the Caribbean as reactionary. This is not meant as criticism, but it is a realism forged, to a great extent, by the endemic nature of our dependent underdevelopment.

By the time Caribbean countries assumed control of their destinies under various guises of independence, they were assured the kind of invidious push start that newly independent governments can always do without. There were the clamouring populations, expanding at a rate, and with a momentum, that now and for some time to come is assured, in spite of successes in reducing fertility to replacement levels. Unfortunately, the population of many countries is expanding faster than the capacity of these countries to provide for them adequately. Here, it must be acknowledged there are differences in the ways populations, environment and development interact and impact upon each other in some countries.

The second major legacy assumed by Caribbean governments is patterns of spatial development—notably urbanization—in the form of ghetto cities that are occupied largely by the urban poor and the working poor. In responding to the demands of the urban poor, however, the "pull" factors in the urban centers have unwittingly been translated into "push" factors in the rural areas. This process is still going on, despite government efforts to reverse the trend.

In addition, this pattern of spatial development is fuelled by weaknesses in the institutional make-up of physical, economic, social, planning and development institutions. Physical planning agencies and development control authorities are constrained to act in accordance with their mandates—to supervise the overall development of their countries—without the necessary political and financial support. The comprehensive zoning plan, while an absolute necessity and a prerequisite to rational land use, is an expensive and time-consuming exercise. Governments have, understandably, found it difficult to justify huge expenditures for compensation payments to affected landowners for property devaluation resulting from a new zoning regime, or for outright land acquisition where that is deemed to be in the public interest. Moreover, zoning plans have been regarded as mere attempts to disrupt the power base of politicians rather than for what they really are—instruments to regulate and control the use of land, based on the carrying capacity of the land and related natural resources.

EIAs have been regarded as time-wasting devices, rather than as decision-making tools that are designed to identify and predict the impact of legislative proposals, policies, projects and programs on the bio-geophysical environment and on man's health and well-being.

Some other factors that compound the difficulty experienced by natural resource management institutions in the public sector follow:

- weak and inappropriate legislation;
- dispersed institutional responsibility;
- inadequate information to support the planning and management process;
- lack of trained staff;
- lack of inter-sectoral and cross-sectoral coordination among agencies whose policy/development actions impact on the environment;
- lack of finance.

The absence of coordination on environmental matters is, undoubtedly, one of the major obstacles to achieving comprehensive planning and management of natural resources, particularly in the Eastern Caribbean. In St. Lucia, for example, there are about 30 separate pieces of legislation that attempt to regulate use of the

island's natural resources. In Jamaica, there are about 50 separate laws. Generally, almost every ministry of national governments has some legal responsibility related to or affecting the management of natural resources. However, at the present time, a statutory mechanism does not exist for natural resource planning, project coordination or regulatory oversight of the various sectors that would ensure programs are compatible across sectors or, indeed, are furthering national goals.

A project organized by the Natural Resource Management Unit (NRMU) of the Organization of Eastern Caribbean States (OECS), which was intended to harmonize environmental legislation, found that gaps and overlaps in the legal and institutional framework were prevalent throughout the sub-region.

The degree of political override that can take place in the management process in some islands is one of the most worrying aspects of the natural resource management process.

St. Lucia provides a recent example. The government, under pressure to provide jobs and, generally, to improve the livelihood of residents in an economically depressed area, supported a major hotel development project for an ecologically sensitive area between the island's world-renowned landmarks—the Pitons—rather than a proposal for a national park. The process of granting fiscal incentives preceded the planning process and the conduct of an EIA. By the time the EIA was conducted, it was too late to reverse the process. Planning approval was eventually granted and, while every single mitigative measure recommended in the EIA was incorporated into the conditions of approval granted by the local Development Control Authority, the suitability of the site for a development of the scope and magnitude proposed was strongly questioned by the EIA expert.

It should be noted that the people of Soufrière strongly supported the development project, as did the constituency representative, who is a member of the party in Opposition. What is not clear, however, is whether this support was grounded in an understanding of the adverse or beneficial impacts of the hotel project vis-à-vis the proposal for a national park.

Another interesting dimension of the St. Lucia experience is a caveat in the *Land Development (Interim Control) Act #08* of 1971, which empowers the Cabinet of Ministers to: ". . . call before it for determination, any development application submitted for consideration by the Development Control Authority." It is not clear whether such legislation is representative of the rest of the Caribbean. We suspect that where it is not expressly stated in law, there is at least facet application. But it is doubtful whether this major institutional challenge to sustainable development will ever be seriously addressed unless the most powerful institution of all—the

people—become sufficiently aware of the environmental imperatives of development to ensure that development actions purported to be taken in their interest are sustainable.

The Non-Governmental Dimension

Let us examine the institutions that are available to facilitate the all-important requirement of public articulation and participation in the resource-management process.

A number of non-governmental institutions were spawned by the Stockholm Conference on the Human Environment of 1972 (i.e., National Trusts, Archaeological and Historical Societies, Naturalist Societies). In many islands, the idea of forming such bodies was promoted by a handful of early converts, responding, it is believed, more to idealism than pragmatism, as they were without the necessary funding to intercede meaningfully in the resource management process. To a large extent this is still the case. Few non-governmental institutions in the region have adequate full-time staff or the financial resources to fulfil their mandate.

The degree to which such institutions depend on subventions from government to pursue their roles is an even more critical factor. This, in itself, weakens the public participation process in such institutions, and the institutions are, therefore, perceived to be more governmental than non-governmental.

Indeed, an examination of the *National Trust Act* for countries of the Eastern Caribbean in particular, reinforces this view. Not only are the laws identical, but they are similar in the degree of control that governments exercise over such institutions, subtle as this control may be.

It is naive to think that the relationship between governmental and non-governmental, environmental institutions will always be collaborative and co-operative. Conflicts will always arise between the proponents of environmental preservation and the proponents of development. The conflicting arguments that abound regarding the use of the land between the Pitons bears this out. Elements of the Trust, who felt sufficiently aggrieved at governmental approval of the project, mounted a public campaign to generate public opposition. The aggrieved members of the Trust may justify their opposition to the development project within the context of advising the public. Government, on the other hand, may argue that the on-going campaign is inconsistent with the aims and objectives of the Trust, as set out in the *National Trust Act*, in that the Trust is designed to advise, not agitate.

Semantics, one may think. But, depending on how strictly the government interprets the action of Trust members, the distinction

between agitating and advising may be strong enough to prompt the government to withdraw the Trust's subvention. The fact that the government of St. Lucia did not do so may be either an indication of its tolerance of criticism, or an indication of a keen interpretation and understanding of the political milieu, given that the Leader of the Opposition—the St. Lucia Labour party (SLP)—is the Chairman of the Council of the St. Lucia National Trust.

The Supra-National Dimension

There are heartwarming signs at this level, which suggest that a new regional environmental order may be developing. The decision to form a Standing Committee of Ministers responsible for the Environment, within the Caribbean Community, gives cause for some optimism. It remains to be seen whether this new institution will be able to deal effectively with the political challenges or whether it, too, will fail, as have many worthwhile CARICOM initiatives, because it lacks political commitment and support. The institution is still fairly young, and should not be subjected to strong criticism at this point. But there would be greater cause for comfort if a clear policy statement was made explaining how the activities, policies and programs of the Committee will be integrated with the other institutions of CARICOM.

This concern is serious and needs to be addressed, if lack of coordination at the national level is not to be repeated at the regional level. Indeed, it is even more critical that coordination be strongly addressed at the regional level. However, efforts to do so would have to be underpinned by a regional planning and development framework that would fully take into account the particularities of space at the national level.

There are also moves at the CARICOM level to strengthen the Caribbean Environmental Health Institute (CEHI), which is based in St. Lucia. The Institute has so far played a critical role in the areas of monitoring, evaluation and research. It has also played an important advisory role to member governments on the state of the regional environment, and has initiated some programs aimed at environmental improvement. As well, increased use is being made by national ministries of the data churned out by CEHI, which, in turn, is fed into their socio-economic development projects and programs.

While this is a welcome development, most of it is on a voluntary basis. A deliberate institutional mechanism that ensures the outputs from the activities of CEHI are used as inputs in formulating policies and programs at a regional level is lacking at this time. An institutional mechanism would influence and

contribute to the process of sustainable development at the national level.

Two areas that readily come to mind are energy and waste management. For example, what would be an appropriate energy mix for Caribbean countries, taking into consideration socio-economic, environmental and geo-political factors? How can solid waste contribute to the energy needs of the region? What are the comparative advantages in the use of sludge ponds, for example, over sea outfalls, and other forms of primary and tertiary waste treatment? How may Caribbean countries increase the efficiency of energy utilization in the home, office or industry?

These are just some of the issues that must be addressed in a regional resource management strategy. At this time, the subject of energy conservation and management does not carry the same degree of urgency as it did in the oil crisis years of the 1970s. But Caribbean governments should be urged to act on the assumption that oil prices will once again escalate, and that, therefore, the best use should be made of the lower prices now being paid.

Other commendable regional initiatives include the National Resource Management Programme (NRMP) of the OECS, the Caribbean Environmental Programme (CEP) of UNEP, and the environmental education and public awareness programs of the Caribbean Conservation Association (CCA) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Country environmental profiles that provide an inventory of the resource management framework of some Caribbean countries have also been prepared.

The OECS/NRMU program had slowed down somewhat (due to the illness of the then Program Coordinator), but there is much to commend in the approach that has been employed so far. The program, however, suffers in the same way as CEHI programs, in that there is no evidence of a systems approach to natural resource planning and management, which ties in the outputs of the OECS/NRMP to the policies and programs pursued by the political, social and economic institutions of the OECS.

At the regional, non-governmental level, the CCA and the Caribbean Natural Resources Institute (CANARI)—formerly the East Caribbean Natural Area Management Project (ECNAMP)—have embarked on programs of institutional reform and strengthening by recruiting qualified personnel. Despite funding constraints, both institutions have been able to accomplish modest, yet important, gains in the areas of training, public education, heritage tourism and sustainable development alternatives such as the fuelwood and sea-moss farming projects on the south-east coast of St. Lucia, piloted by ECNAMP.

However, both bodies suffer from the limited dialogue they have been able to achieve with NGOs at the national level. Moreover, there is little evidence that the more than 120 NGOs with environmental mandates in the Caribbean are working within an overall plan or strategy. CCA is now addressing itself to the subject of a regional environmental education and communications strategy, through a project funded by the Canadian International Development Agency (CIDA).

But key difficulties experienced by consultants working on the strategy were coordinating institutional inputs and identifying an appropriate regional environmental institution to fulfil that role. It was eventually decided to entrust CCA with this responsibility, rather than the CARICOM Consultative Forum, given the unsettled nature of the Forum's existence.

The Educational Dimension

The role of education in the process of sustainable development hardly needs to be justified, for it is clearly the most effective means available to policy-makers for communicating to the population the need for sustainable development. The World Commission on Environment and Development noted:

> "Most people base their understanding of environmental processes and development on traditional beliefs or on information provided by Conventional education, and remain ignorant about ways in which they could improve traditional production practices, and better protect the national resource base. Education should therefore provide comprehensive knowledge encompassing and cutting across the social and natural sciences and the humanities, thus providing insights on the interaction between natural and human resources, between development and environment."

IV. THE WAY FORWARD

The International Lesson

Caribbean governments have never before received stronger signals for a more inward-looking and permanently integrated approach to sustainable development of their countries and of their region than they do now. The spectre of the Warsaw Pact breaking down barriers has moved beyond the point of simply providing prime-time

television drama, to receiving primary attention from Western governments and the international, donor community.

The inexorable movement of Western European governments toward tightening their regional embrace and pooling their already significant resources into a regional common market, placed alongside the purposeful march of the "economic bloc brigade" throughout Asia, the Pacific and North America, should clearly indicate to Caribbean governments the need to act swiftly, if the people of the region are not to become prisoners of the "marginalization" process.

However, the strongest challenge posed to Caribbean governments by consolidation in many parts of Europe, Asia and the Pacific is to exercise control and not to allow themselves to be sucked into a reactionary, irrational, desperate and panic-ridden response to these international events, daunting as they may be. The situation calls for sound, strategic planning for the sustainable use of available resources.

The events in Eastern and Western Europe provide strong clues to the way we should proceed. The moves toward political integration between East and West Germany, and in other parts of Western Europe are undoubtedly potent indicators. But an equally impressive indicator can be found in the common agreement among all countries in Western Europe that the state of their natural environment is gravely imperilled, and that the significant strides they have made in generating double-digit rates of economic growth have been at the expense of the natural environment. Among the concerns that must be dominant in the minds of West Germans, for example, is the deplorable state of the physical environment in East Germany. One can be sure that a critical element in the strategies that will emerge out of the unification of East and West Germany will be the purification of East Germany's environment. Indeed, who can say this was not one of the main reasons for a move toward unification in the first place?

The major lesson for Caribbean governments and peoples to learn from these international events is regionalism makes sense, from all points of view. If we ponder dependent underdevelopment, and consider all of the possible options available to us—empty sovereignty, hollow independence and persistent poverty—then evaluate the benefits and losses of each alternative, we must conclude that regionalism makes sense. If we agree that regionalism makes sense, then we should ask why our governments have not taken stronger, more decisive and irrevocable steps to realize that goal?

Strategic planning for regional development is affected by the absence of political will in the same way lack of political support and commitment operate to frustrate a rational approach to planning at the national level. In the first part of the paper, we identified the

problem with the fears politicians have that their power base will be eroded by bureaucrats. But what really is the power base of the politician if not the people.

Five Imperatives for Sustainable Development

From the foregoing analysis we have identified five imperatives for sustainable development: regional, political, human, educational and environmental.

The Regional Imperative

Regional and strategic planning and development institutions within CARICOM have experienced reluctance on the part of Caribbean governments to cede political sovereignty. This has severely undermined the management process, and has militated against exercising the necessary management controls. In this situation, compliance is determined by the will (or whim) of the member country.

The implications for the natural resource management process is clear because common agreement and irrevocable commitment are necessary for the success of a full range of initiatives. For example, the absence of legislation requiring that EIAs be fully integrated into the decision-making process of national institutions can have severe repercussions, not only in the quality of the shared environment, but also by increasing the vulnerability of the region by providing loopholes in the regional network that unprincipled multinational companies could exploit. Similarly, the failure of any one country to ratify international conventions prohibiting the trans-boundary movement of hazardous waste would increase the vulnerability of the region to environmental pollution.

There is the all-important question of the appropriate regional, political framework to support regional planning and developmental initiatives. Whether or not such a framework is established through federation or through the creation of a single state, or some combination of these systems, it must permit:

- more effective coordination, communication and control of regional policy;
- a harmonized approach to policy formulation and implementation that ensures cross-sectoral impacts of policy can be more fully assessed, and that the ecological dimensions of policy can be considered at the same time as the economic, trade, energy, agricultural and foreign affairs policy;

- the emergence of a supra-national dimension to policy formulation, in which policies formulated at the center can develop in parallel with national policies, and be absorbed by them as consensus emerges—given that this supra-national initiative will depend on the efficient implementation of its programs by the national machineries, there must first be a concerted effort to address administration and institutional difficulties at a national level;
- the translation of strategic and regional planning into action by maintaining impetus through continuous review of strategic issues and policy, as well as through administrative reorganization, where there is evidence that the principle of effective implementation has failed;
- the removal of fragmentation that is engendered at the regional level, where a multiplicity of governmental and non-governmental, environmental organizations operate outside of an organized and cohesive framework, and without clearly allocated roles and responsibilities—this will also permit more optimal use of scarce financial and technical resources;
- the harmonization of environmental incentives as a means of encouraging the sustainable use of natural resources.

The Political Imperative

This imperative is composed of actions that should be taken by national governments.

- Caribbean governments should commit themselves to regional planning and development strategy, the centerpiece of which should be pooling, allocating and redistributing resources (human, physical, financial, technical and technological) as well as markets ultimately for the benefit of their peoples.
- Caribbean governments should commit themselves to providing the necessary political conditions that will support regional and strategic planning and developmental initiatives, by removing contentious territorial issues.
- Caribbean governments should recognize that only full integration of political institutions will provide the necessary stability for effective regional and strategic planning and, ultimately, for the attainment of sustainable development.

The Human (Social) Imperative

Recognition of the need to develop approaches that will assist all of the people in realizing their fullest potential must be at the heart of the human imperative. The key operatives in this imperative must be institutions that are geared toward mobilizing the full energies of the populace by instituting a system that guarantees their fullest participation in development plans, and provides them with the necessary skills—through education—to enable them to contribute meaningfully to the developmental effort.

This is, perhaps, the most difficult institutional challenge to be faced in the pursuit of sustainable development because it forces a re-orientation of the institutions themselves. It will require, first of all, a re-absorption of government into the community body, by cultivating the habit of community action, instead of waiting upon government to do it. A mechanism is required that would allow for effective consultations with, and participation by, the people at large.

Some countries—Jamaica, St. Lucia and Guyana—have experimented with systems of decentralization, with varying degrees of success and failure (note the case of St. Lucia). Many members of the Regional Council, who are key community members, admitted to an overwhelming sense of frustration because the Councils were without the power and resources to make things happen. Unfortunately, the system was allowed to collapse without any concerted effort to address its shortcomings.

Other institutional responses that will be required are:

- a re-ordering of the approach to redistribution of the benefits that accrue from the developmental process to satisfy, first, the basic needs of all of the people;
- the reorganization of community development ministries and the training of staff, in order to equip them with the skills that will enable them to apply innovative approaches to mobilizing the energies of the people at the community level;
- the search for novel sustainable alternatives to the unsustainable use of physical resources by the poor;
- the removal of barriers that may impede efforts at mobilization and full utilization of the human resource (for example, landholding and ownership patterns that force the landless and the poor onto marginal land), rigid zoning and building standards that militate against the self-help element in housing, employment and other areas, and illiteracy;
- the pursuit of integrated rural development strategies that combine an understanding of, and appreciation for, the particularities of rural space and the aspirations of the users of rural space;

- the pursuit of a human resource development policy that pays special attention to the needs of women.

The bedrock of the institutional responses identified above is the "basic needs" model of development. Its appeal does not spring from a Marxist or socialist base, but from a base of reality and rationality. There is the economic justification put forward by C. Stone, that if the minority continue to control the flow of income, the buying power is not in the hands of the majority to produce the quantities and types of goods countries need for survival. The social justification is perhaps the most powerful, in that poverty and deprivation anywhere constitutes a threat to prosperity everywhere. This is particularly relevant in the context of environmental degradation, for, as we have argued, poverty and deprivation tend to encourage recklessness in the relationship between man and his environment.

The Educational Imperative

S. Briceno has identified the most powerful justification for an environmental educational imperative, ". . . in the ignorance that exists among the diverse elements in all sectors in society, particularly those that share the same resources." His call ". . . for a major involvement and investment in our educational systems for integration of a consistent and positive behaviour towards our environment as a key strategy for sustainable development . . . require endorsement at the highest level of our political and development planning institutions." Indeed this need was identified by the West India Royal Commission as far back as 1945. Education, the Commission noted,

> ". . . should teach people how best to make use of the resources of their country of the opportunities of social organization, and of their individual talent to enable them to lead lives as healthy, as satisfying and as prosperous as possible. . . . Education in this sense begins at birth and perhaps takes place most powerfully for good or ill in the first four or five years. . . ."

The key strategy components that should underpin the educational imperative are:

- developing programs that combine both a stimulating and a nurturing environment with good parent/teacher education to reinforce concepts taught;

- strengthening the capacity of national and regional training institutions for teachers, through the expansion of teacher-training programs, to include environmental education;
- developing an integrated approach that combines formal and informal educational approaches and promotes public education and awareness at all levels in our societies, to enhance consciousness and respect for the environment by our peoples, and to encourage behavioural patterns conducive to its preservation.

The Environmental Management Imperative

While all of the aforementioned imperatives impact either directly or indirectly on the process of sustainable development, a schema should be proposed that addresses the requirements of environmental planning and management specifically. The ideas that follow are premised on providing the necessary conditions that will induce a certain level of effectiveness in implementing the substantive and procedural aspects of the policies proposed. The presence of the following factors is vital:

- strong and irrevocable political support;
- adequate financial and manpower support;
- relevant and accurate data available for use in the required time frame;
- the necessary institutional apparatus to enable natural resource managers to control and communicate policy effectively;
- the ability to exercise firm sanctions that will ensure compliance.

The schema proposed, is designed around the reorganization/ creation of the following three regional institutions:

Standing Committee of Ministers of the Environment (COMET). It is envisaged that COMET will have the following responsibilities:

- formulate a strategy for generating and redistributing manpower and financial and material resources that will assist environmental management efforts at the national level;
- consider international recommendations, protocols or conventions that are promulgated from time to time and that make appropriate recommendations to CARICOM for ratification, adoption or rejection;
- consider recommendations, standards or guidelines formulated/proposed by REAP;

Regional Environmental Protection Agency (REAP). It is envisaged that REAP will have the following responsibilities:

- formulate a regional, environmental policy that takes into consideration and ties into, regional economic, social and cultural policy;
- undertake regular reviews of the state of the regional environment and communicate the results to resource managers at the national level;
- provide quick-response services to national governments in the following areas: conduct of EIAs, conduct energy efficiency audits, coordinate multi-disciplinary skills and expertise for use by national governments in the aftermath of natural and man-made disasters;
- provide advice in areas of natural resource management for example: land/agri-chemical input/yields that affect agricultural production, sustainable forms of waste disposal, watershed management, environmental health management, coastal zone management.
- coordinate financial and manpower assistance to national governments;
- coordinate formal and informal training of natural resource managers among institutions at the governmental and non-governmental level;
- provide trainer inputs into national and regional training activities that fall within the ambit of a regional, environmental strategy for education and training;

Regional Network of Non-Governmental Environmental Agencies. The Caribbean Network of NGOs on the Environment is envisaged as the repository for coordinating the activities of the over 120 NGOs that exist in the region with environmental mandates. It anticipates a key role for institutions such as the CCA, CANARI and the Consortium of Caribbean Universities, based on the following allocation of responsibilities:

to CCA

- coordination of environmental communications and education, as well as public awareness programs;
- seat of a Regional Environmental Information Center linked to the data base of the Regional Co-ordinating Unit (RCU) of UNEP, and providing timely, relevant and usable data to journalists, students, researchers, etc;
- coordination of training;

to CANARI

- execute training projects at the community level;
- provide advice on community-based resource management strategies.

to CONSORTIUM

- coordinate and execute formal training programs and projects;
- periodic reviews of school curricula that would determine what shifts in focus are necessary to ensure that educational programs are geared toward the overall goals of sustainable development.

The above schema assumes the continuation and/or introduction of strategies at the national level that are based on the following requirements:

- setting up consultative/participating mechanisms, such as the decentralization model;
- providing a strong level of political support for the merits of strategic planning and environmental management;
- establishing comprehensive zoning plans that include systems plans for parks and protected areas;
- training and retraining staff of the Physical Planning and Development Control Departments;
- reviewing and introducing institutional coordination mechanisms such as: the Committee of Permanent Secretaries and the Committee of Chief Technical Officers;
- pursuing a planned program approach to development based on short, medium and long-term plans;
- establishing "environmental desks" in External Affairs Ministries;
- streamlining the decision-making process so that the political directorates have all of the facts before them before a decision is taken on the type and level of fiscal incentives that will be granted to a developer.

The schema assumes the continuation/introduction of the following activities at the international level:

- coordinate strategies aimed at convincing the super powers to redefine global security, to include issues of population, environment and sustainable development;
- lobby for international financial institutions to institute a requirement that EIAs be conducted as part of the planning and design stages of projects they fund;

- agitate for the redeployment to environmental programs, resources that have been saved by dismantling military hardware as a result of lowering tensions between the East and the West;
- encourage international donor governments and institutions to consider debt for nature swaps.

V. CONCLUSIONS

This paper argues that our approach to development must be based on the reality of the resources at our disposal. Implicit in this realistic notion is acceptance of the fact that being poor, underdeveloped and dependent countries there are not many options open to us for feeding, clothing, housing and educating our peoples, or for protecting the population from ill-health. We do not possess the technology or the mineral and capital resources of the more advanced, capitalist systems. No quick-fix economic solutions are available to us.

Still, that our natural resources are not infinite, is a fact that has eluded us, for some strange reason, until recently and, unless managed carefully, they could provide us, at best, with only short-term gains, having adverse long-term consequences.

In this paper, therefore, we argue for a total, or systems, approach to sustainable development, noting that everything man does or does not do will impact on the environment, either beneficially or adversely.

We have addressed the institutional requirements for supporting the sustainable development process, and for ensuring that we maximize our gains and minimize our losses. How can we achieve the goals of quality and quantity in agriculture, manufacturing and industry, without polluting the very air that we breathe, or damaging the health of those needed to work in factories? Herein lies the institutional challenge. It will require profound changes in the way we see things and do things. It is no longer adequate to think only in terms of jobs created, infrastructure provided, schools, hospitals and homes built, significant as these goals may be. It is pertinent to ponder the environmental consequences of these actions and, in this regard, there is a shared responsibility for all of us.

Economic Policy and Sustainable Development in the Caribbean

Clive Y. Thomas

"Development also implies preserving the stability of the environment and putting an end to the degradation it has suffered through the growth of national production in Caribbean societies. This is a simple and straightforward point which merely seeks to situate the region's development within the context of an unequivocal acceptance of our universal responsibility to protect the environment and sustain life."

The Poor and the Powerless: Economic Policy and Change in the Caribbean. (Clive Thomas)

I. INTRODUCTION

Because this paper is part of a collective endeavour oriented toward elaborating key elements of a policy framework for sustainable development in the region, the injunction not to let definitional issues serve as a distraction in the preparation of the papers is wise. In my presentation I work with the simple and effective definition offered by David Pearce of the London Environmental Economics Centre: "sustainable development is about being fair to the future. It is about leaving the next generation a similar, or better resource endowment than that which we inherited." This is consistent with the view of the Brundtland report, that in meeting the needs of the present, societies should not jeopardize the ability of future generations to satisfy their needs.

This definition suggests a logical division of the policy framework into two general areas of consideration. One is the creation of a framework that would permit the systematic search for,

and consequent elimination of, all public policies in the region that are, or run the risk of becoming, "unfair" to the future. The other is the reconstruction of public policies so that as far as possible they meet the criterion of fairness. The significance of this division is that while optimally both considerations should be taken together, the nature of the region is such that operationally this may not always be practicable in all countries. For the sake of convenience, the former areas of consideration may be referred to as the "don'ts," and the latter the "dos." This paper deals principally with the latter. It is useful, however, to identify the major don'ts, since these form an underlying theme in my presentation.

One major "don't" is the rejection of economic policies of growth, savings and accumulation that recklessly increase current consumption at the expense of future consumption. This means the rejection of all natural resource exploitation without the prior determination and establishment of the sustainable limits of their yield.

The second "don't" is the rejection of laisser faire attitudes toward the limits of sustainable natural resource use. This means the rejection of all policy frameworks that do not contain programs of research into resource conservation, as well as the buildup of national and regional capacities to compensate for eventual loss of exhaustible, non-renewable resources.

The third "don't" is the rejection of similar laisser faire attitudes in the international community. This is likely to happen if governments fail to value correctly the merits of concerted global action.

The fourth "don't" centers on the widespread, regional approach of treating waste disposal as an item of low priority. Material and energy inputs into economic processes eventually become waste that can only be disposed of in the natural environment. Waste, therefore, cannot be rationally justified as a low priority or incidental feature of development programs.

The final "don't" is the rejection of a policy framework that does not recognize the human implications of sustainable development. All dimensions of human existence interact with economic processes and the environment.

These "don'ts" indicate the central importance of a dynamic approach to sustainability. Being "fair to the future" ultimately depends on the enlargement of regional and national capacities to cope with a fast-changing world. In order to achieve this, it is necessary to develop a policy framework that focuses on the systematic removal of hindrances, obstacles, impediments, and inflexibilities in the economic system, as well as on the social and natural bases for coping with change in the region.

II. THE ENVIRONMENT-RESOURCE-ECONOMIC RELATIONSHIP

Construction of an appropriate policy framework for sustainable development in the region has to be grounded in certain realities. First, regional policy must respect and reflect the variation that exists among countries. A few key indicators are: population, employment, land mass, population density, external indebtedness and per capita income. The variation in land mass is striking, ranging from Guyana with 79 per cent of the total, to Montserrat with 0.04 per cent. Of the 13 countries in the region, as many as 9 account for only 3 per cent of the land mass. The population variation is equally striking. Two territories, Jamaica and Trinidad-Tobago, account for about two-thirds of the region's population, while 10 countries account for less than 25 per cent. The land-person ratios also show marked variation. These range from 589 persons per KM^2 to 4 per KM^2. In addition, we have as many as 6 territories with population densities of 200 persons per KM^2 and above. This density is among the highest in the world, and is found in the smaller countries. The larger islands and the two mainland territories are better endowed. In the latter, the sparser population is located in communities largely surrounded by land masses that are not beneficially occupied.

There are three other elements that have significant variation: high levels of unemployment; per capita external indebtedness in some countries (Guyana, Jamaica, Barbados, Trinidad-Tobago and Antigua) is among the highest in the world; per capita income ranges from about US $11,500 in the Bahamas to US $455 in Guyana—the higher incomes are among the highest in the hemisphere and, indeed, in the entire Third World.

The table on the following page shows the trends in income growth over the past decade. In so far as this is both a measure of performance and, along with the other indicators, a measure of capacity to cope with change, the variation among territories is of considerable importance. As the data show the performance of Guyana and Trinidad-Tobago has been negative in the 1980s, but in several other territories growth rates have been very impressive by international standards.

Second, the policy framework must encompass the region's high dependence on resource-based economic activities, developed for export. Agriculture, mining and quarrying, and tourism contribute to the gross domestic product (GDP) in the following ranges, respectively: 5-36 per cent; 0-26 per cent; 5-36 per cent. Exports as a percentage of GDP range from 33 to 94 per cent, and imports from 29-117 per cent. There is also a high commodity concentration in these activities.

Caribbean Countries — Growth of GDP, 1977-88
(Constant Market Prices)

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Antigua[1]	7.5	9.1	7.8	8.7	4.7	1.5	7.4	7.1	7.8	8.4	8.8	7.6
Bahamas	3.4	3.4	8.0	6.5	-0.2	0.7	3.5	14.1	4.8	1.8	4.6	4.7
Barbados	3.7	6.1	7.7	4.7	-3.2	-5.0	0.2	3.4	0.5	4.7	2.0	3.5
Belize[2]	—	7.9	-3.9	5.5	6.3	-2.4	0.1	5.4	2.3	3.5	5.0	7.5
Dominica[3]	3.4	12.3	-16.9	10.5	10.1	4.1	3.0	6.9	1.5	6.8	6.8	5.5
Grenada	5.5	5.1	2.1	-1.5	5.0	0.5	-2.9	2.0	3.7	5.5	6.0	4.3
Guyana	-4.5	-1.5	-0.7	1.9	4.5	-12.4	-9.3	2.1	0.9	0.2	0.7	-3.0
Jamaica	-2.5	0.5	-1.5	-5.5	2.5	1.1	2.3	-0.9	-4.5	2.1	4.9	1.9
St. Kitts[1]	—	—	—	3.9	5.1	6.3	-1.1	9.0	5.5	6.3	6.5	4.7
St. Lucia[1]	—	12.0	3.7	-0.5	1.2	3.0	4.1	5.0	6.0	5.9	2.0	5.0
St. Vincent	3.5	10.5	3.7	2.7	7.4	6.5	5.5	5.3	4.5	7.2	5.7	5.4
Trinidad[4]	7.7	7.5	7.3	6.5	5.2	1.7	-7.3	-12.5	-2.9	-5.4	-2.3	-4.0

[1] 1986 - 1988 at factor cost
[2] Series revised beginning 1982
[3] At factor cost
[4] Preliminary
— Not available

Source: IBRD Economic Memoranda, as cited in World Bank, Country Study, Caribbean Countries, 1988, T. Hoeker, Caribbean Economic Performance: "An Overview." Paper presented to Second Conference of Caribbean Economists, Barbados, 1988, and Inter-American Development Bank, Annual Report 1988.

The variations in income levels and growth performance reflect variations in resource endowment and their utilization for export. The highest levels and best performances in recent years are associated with tourism, while in earlier periods countries producing petroleum, bauxite-alumina and sugar for export benefited from commodity booms. This suggests another dimension of variation to which a policy framework should respond: variation within countries as they pass through different phases of commodity export cycles.

It should be noted that both petroleum and bauxite-alumina and several agricultural products have been in decline, some since the mid-1970s. This has produced two reactions of note: In Guyana, a "gold and diamond rush," with all the attendant environmental abuses, intensified destruction of the traditional habitats of the indigenous Amerindian peoples. Also, in several of the territories, as agricultural output declined, yields dropped and diminishing returns set in, small farmers moved into "narcotics farming"—again with all the attendant environmental abuses.

Third, the policy framework must embrace an overriding shared feature of all territories: small size. This places severe limits on available policy options. By world standards, all of the countries are small, with limited resources and small markets for capital, intermediate and final consumption goods.

A priori this suggests two things: the appropriateness of a regional approach to sustainable development; and that a regional approach will reduce, but will not be able by itself to eliminate, all the diseconomies that small size generates. Thus, we could expect the per capita cost of achieving ecological stability in the region to be higher than the world average.

Similarly, the per capita costs of negative externalities could be higher than the world average. In particular, we might expect negative social effects (drugs, stress, etc.), global inequities (pollution, waste disposal, etc.) and the pressures of resource scarcity to be disproportionately felt by small countries, even in a regional grouping. For example, already there is considerable evidence that unequal access to land, plus land scarcity, have produced responses in several countries that reach national crisis levels in agriculture: parcelling of land, degradation of hillside slopes and water catchment areas, over-exploitation of agriculture, forestry and fishing resources. These developments are evident in the movement of the region from a net food exporter, to a net food importer of US $1.3 billion, or 13 per cent of the region's national output. The consequence of this agricultural decline has been the failure to develop linkages in many countries in the booming tourist sector and in the agro-processing sectors, which result in even further dependence on imports.

Fourth, in common with many other Third World regions, the relationship of the environment and natural resources with economic life is central. The more important dimensions of this are:

- the impact of poverty on resource over-exploitation in all sectors;
- a pattern of resource exploitation in which transnational corporations (TNCs), guided by global profit considerations, are allowed to invest and operate with little or no safeguards over the rate of depletion, levels of pollution, or health and safety features;
- high external debt levels and foreign exchange pressures that reduce the potential resource flow for conservation because it is feared that the imposition of environmental standards will lead to lower rates of resource exploitation;
- the use of production facilities with inadequate safety and occupation standards, again because it is feared that these enterprises may leave and, thereby, exacerbate the unemployment problem;
- widespread sale in the region of products without the product information on labels, and the sale of items prohibited in originating countries (e.g., drugs and pesticides);
- a tourism industry, which "bites the hand that feeds it," in the sense of generating environmental consequences that reduce its main attractions—beach decay, pollution, the spoliation of aesthetic sites, etc.;
- a decline in resource monitoring—a good example is agriculture, where climatic data are now collected mainly at airport sites and not necessarily in agricultural communities, which has reduced the region's capacity to monitor micro-climates;
- the initiation of mega-projects that have tremendous social, natural and environmental consequences, with little or no prior scientific environmental impact assessment studies;
- the existence, within the context of resource shortage, of inequities in access to and control of resources—farmers, who own about two-thirds of the farm holdings, operate on less than 2 hectares and together these small holdings occupy only 14 per cent of total farm acreage.

Fifth, there is a tendency in recent policies to worsen the environment-resource-economic relationship. Population projections show continued high growth rates and migration outlets are likely to decrease, which will result in a larger unemployable population. Data show rapidly increasing urbanization, with the urban-rural distinction in many of the smaller territories already effectively blurred. The data also show that, as agricultural yields have

declined, not only have farmers turned to narcotics, but chemical application in agriculture has risen dramatically, and is now only constrained by the foreign exchange cost.

In addition, whether the situation is drought, floods, hurricane, or low-lying land, water is one of the most important natural resource constraints to the region's agriculture. Here again, the data reveal poor prospects because drainage and irrigation schemes continue to be neglected, sea defences collapse, watershed areas are abandoned, and the construction of storage capacity is failing to keep pace with the likely needs for water.

In conclusion, it should be pointed out that the importance of the environment-resource-economic relationship is such that there is clearly an impelling need for the careful harnessing of the region's natural and human assets.

Current resource use is oriented toward the production of primary products and tourism for the overseas market, and systematically places the lowest priority on the needs of the domestic population. To the extent the damage that has been done and is being done may be irreversible, means a permanent reduction in the productivity of the region's resources. Despite the existence of irreversible damage, however, being "fair to the future" requires that the region's policy framework comes from the hypothesis that there is nothing inevitable in this rhythm of development and, therefore, in our continued neglect of the environment-resource-economic relationship.

III. THEORY

IVA feasible program for sustainable development needs to be consistent with the level of theoretical advance. The policy framework for sustainable development outlined in this paper focuses on the capacity to change, or to produce out of the resources available for economic use. In theory, this production potential comprises three major elements: namely, the stock of instruments or "means of production;" the stock of labour potential, including all labour's embodied skills; and the stock of environmental and natural resource wealth. Mainstream economists capsule the last category into land, which is then termed a factor of production, with particular emphasis on agricultural resources (soil, weather, water supply, etc.), energy, and industrial raw materials.

In terms of the three elements identified above the production possibility of a country should be assessed in terms of the broader interpretation of environment, rather than the limiting notion of land as a factor of production.

The three elements, therefore, plus their actual and latent substitutability make up the production possibility or potential. Thus, labour is both an asset and is also dynamically substitutable with the other elements; the reverse is also true. When put this way, the economic choices and trade-offs of sustainable development depend largely on the explicit and implicit valuation given by society to these three fundamental categories of wealth. The stock of environmental wealth, however, is so varied and pervasive as to be in very many areas not tradable at all, thereby reducing its amenability to the mechanisms of market valuation.

There is, it might be added, the additional concern expressed by some theorists that nature, in the basic forms being alluded to here, is so fundamental to life that it can never be made amenable to valuation based on the vulgarity of market trading.

In the absence of a valuation system, market economies appropriate many environmental services as if they were free goods. The nature of markets, however, is such that where a service's price is undervalued, or not valued at all, there is an invariable tendency to overuse it. This concern has spawned the application of shadow pricing, objective accounting valuations and environmental impact assessments in the use of these resources.

In devising a policy framework, account should be taken also of the other view, which states that the stock of environmental assets is ultimately so limiting that our concern should go deeper than a mere adjustment along the lines of shadow pricing since even these can be distorting. To this should be added the additional concern that with massive levels of unemployment prevailing in the region, both the market and shadow valuations of human resources lead to distortions. This can, in fact, be generalized to the employed poor, women, youth, small traders, small farmers, and the landless peasant.

A careful reading of the literature indicates there are other important theoretical considerations that need to be acknowledged in devising a regional economic policy framework: First, environmental effects occur locally, regionally and globally, but these are not necessarily discrete and separable spheres of our habitat.

Second, given the global distribution of national production and resources, the time preference for consumption now as against the future (i.e., being "fair to the future") may not yield the same rate at the margin for different countries and regions. Differences in these rates could yield differences in the priority given to conservation.

Third, environmental decisions in the region have to be based on the recognition of two distinct levels of economic distress. One is the long-term underlying distress associated with underdevelopment, and the other is the accentuation/intensification of this condition in several territories since the 1980s, and in some instances earlier. As

these levels of economic distress are not common to all players in the global arena, being "fair to the future" has distinct implications about being fair to the present.

Fourth, there is the observation made by Edward Barbier, of the London Environmental Economics Centre, and others, that while in conventional economic theory natural resources are valued exclusively in terms of their function as raw materials or energy inputs to economically valuable outputs, it is imperative that their future physical scarcity be regarded as a strategic constraint. This would then force consideration of their optimal rate of depletion, either through market or non-market methods, and in the context of sustainable development, two additional factors would then have to be carried into the valuation:

- the costs associated with waste-products disposal that are generated in this input-output process, which feed back on the environment, and very often in negative ways;
- the consideration that the natural environment supports human life and economic activity in a number of ways that are not readily known, acknowledged, or accounted for.

Incorporating these would make the economic valuation of natural resource-based activities in the region far more complex than has traditionally been admitted. In this formulation the outer limits of natural resource exploitation lie not only in its disappearance, but in the impact of its continued utilisation and the capacity of the environment to sustain development and human livelihoods through all time. This formulation would also seem to justify the emphasis placed on capacity to change. A key factor in defining the outer limits, therefore, could be represented as the development of a capacity to change these conditions, which in turn depends on the development and application of innovations in the field of environmental management, especially in the form of waste control and re-absorption. One of the major policy implications that follows is the need to devise a system of incentives and rewards to promote this type of development.

The present state of theoretical development leaves at least four other major conundrums unresolved. First, there remains considerable disagreement as to whether sustainability is compatible with the patterns of economic growth in the region.

Second, given the constraints identified, it follows that trade-offs will have to be negotiated, but how can these be resolved in a social, political and economic environment such as ours, where foreign influence is overwhelming and social and political structures remain primarily authoritarian and hierarchical?

Third, which groups, classes, strata, economic or political agents will make the choices? Given the orientation of sustainable development toward participatory and democratic forms, must these forms necessarily precede a serious engagement of the issues.

Fourth, being "fair to the future" raises complex issues of measurement of inter-generational and inter-country utilities. Given this, how do we maximize expected utility where irreversible incidents may or may not occur? How do we treat the uncertain and probable likelihood of an occurrence. Is this a matter for the adoption of a safe minimum standard, based on game theory methods and the use of minimax loss principles? Answers to these questions will have a decisive bearing on the formulation and application of economic theory to an appropriate policy framework.

IV. POLICY

So far we have looked at the economic policy implications of sustainable development from three analytical vantage points:

First, the definition advanced in I above suggested an operational division of the framework into dos and don'ts; both aspects of the framework having a common reference point: the enhancement of regional and national capacities to change.

Second, highlighting the environment-resource-economic relationship in the region indicated that the policy framework needs to be flexible enough to cope with five factors: regional uniformities and variations; the extreme dependence of the regional economy on resource-based activities; the acute problems of size in small and microeconomies; the widespread replication in the region of many of the negative features found in other Third World countries; and the strong tendency emanating from present occurrences toward a worsening of the relationship, as can be seen in long-term trends in population, urbanization, water management, and so on.

Third, in the theory section it was also pointed out that many fundamental issues of immense practical significance remain unresolved. These create major dilemmas for public policy. Among them are: how to make a correct valuation of environmental assets; how to determine the trade-off principles to be used in the environment-resource-economic relationship; and how to deal with situations of uncertain risk?

Environmental Accounting

There is now widespread recognition of the many anomalies in the way we compile our national accounts and use them as a measure of

economic progress. Thus, expenditure on cleaning up pollution adds to the national product, but over-exploiting of non-renewable resources and spoliation of the environment are not accounted for. More generally, while present national income accounting practices depreciate man-made assets, natural assets as a rule are not similarly depreciated, even though the case has been forcefully made that depletion of these is conceptually the same as capital consumption. Moreover, when expenditures to replenish or prevent the deterioration of natural assets do enter national accounts, they are frequently under-valued, and, indeed, the loss created would not be deducted from the value of the national product.

These practices clearly need to be rectified. However, many conceptual problems still remain unresolved. Countries that introduce new practices should require the accounting systems they adopt to facilitate inter-country comparisons, as well as comparisons over time. Based on this, the following changes should be sought:

- National income accounts and comparability of standards should incorporate a separate accounting framework for environmental concerns. The United Nations Economic Commission for Europe reminds us it is important to agree on a global methodology for social accounting: '. . . despite 20 years effort, the attempt to integrate social indicators into the System of National Accounts has been a failure.' Robert Repetto of the World Resources Institute, suggested that these separate accounts can be linked to the standard national accounts through extended measures of depreciation and capital formation and the redefinition of final expenditures of households and government to exclude environmental protection costs.
- Efforts should be made to prepare broader environmental indicators. Three broad groupings could accommodate the major concerns facing the region:

Indicators of the Level and Type of Environmental Stress

These are: natural resource extraction, polluting discharges of all types by sector of economic origin, utilization of productive agricultural land and other major economic zones, beaches, their size and location, hillside vegetational cover, forest areas, especially in the two mainland territories, sea defence, river protection systems and other forms of flood protection, water supply.

Threshold Levels of Stress and Levels Attained

These would provide data on the national, regional and international standards being applied in such areas as the use of non-renewable sub-soil resources, as well as those renewable only at the geological rate; the cyclical elements to be achieved where resource renewal is dependent on water, soil, atmosphere and other physio-chemical processes; and the animal and plant life of ecosystems. They would also indicate the levels of attainment.

Other Sustainable Indicators

Here more use should be made of a variety of indicators: the quantity and quality of investment in human resources, investment in environmental research and development (R&D), institutional capability in major areas of the environment, and the quality of environmental data collected by the United Nations Environmental Programme (UNEP).

To institute the above suggestions would require, initially, the formation of a facilitating mechanism through the CARICOM Secretariat. This should ensure from the outset that the requisite interfacing with relevant national and international agencies is achieved.

Cost-Benefit Analysis

Projects financed either directly or indirectly, by public funds or intervention (e.g., incentives, subsidies) would seem to offer the best avenues for the early introduction of environmental concerns into the economic decision-making process in the region. Environmental criteria should be introduced at the pre-project evaluation stage so that the valuation of the stream of benefits and the costs of economic activity take fully into account other considerations such as the stock of natural resources, environmental quality, the quality of social life, and so on.

To achieve this, specific proposals must center on two things: adding environmental costs and user costs to the price of natural resource inputs, and adding pollution costs to the price of outputs. As David Pearce puts it, rationally, the price of any output should be made equal to the sum of its marginal costs of extraction, environmental effects and user costs, which include pollution changes. The cost of compensating offset for environmental damage should also be included in the assessment of new projects. Where resources are non-renewable, the depletion premium applied should also ensure

the sale price fully takes into account the increased future costs of acquiring these resources, as stocks diminish. The premium should, in other words, discourage low-productivity users of non-renewable resources, and do this at an increasing rate, as stocks diminish.

Increasingly, several techniques are being applied to cope with these situations. Some incorporate into project evaluation the reduced productivity that a project might generate in other areas. Others charge to a project loss of earnings for all forms of property (including wages) that result from the environmental effects of the project. Others incorporate the cost of replacing lost output. Still others seek to determine the cost effectiveness of the methods used to avoid environmental damage or to meet national-regional-international standards. Very recently, experimental, surrogate valuation techniques have been used to compare two situations where everything else is similar except the environmental factor.

The spread of these techniques is highly desirable, and the region should be fully involved. It is important to bear in mind, however, that for several reasons, they fall far short of being a panacea. First, the timing of projects is usually far shorter than that over which environmental effects are fully realized. As a result, net present value arrived at by using discount factors that favour the present over the future may lead to situations in which high incomes now, followed by low incomes later, are preferred to sustainable incomes. Second, lack of knowledge about environmental effects, especially how they work and their long-term implications, makes it very difficult to identify and determine the precise character of the environmental stress. This makes the task of putting a monetary value on these effects very hazardous. Not surprisingly, some commentators argue that some of these effects (e.g., loss of life) are incapable of being reduced to measurement by a monetary standard.

At present, the circumstances that face those engaged in environmental impact assessment studies leave much to be desired. Issues involving the measurement of inter-generational well-being and externalities, which at present cannot be determined and which run the risk of irreversible change, combine to create a situation where independent, qualitative assessments outside the framework of monetary valuation should play a key role in the region's move toward more sustainable development policies.

Research and Development

A society's capacity to cope with change is contingent in large measure on the policies it pursues, both formal and informal, in the area of research and development. This proposition is implicit in our call for innovations in environmental accounting and cost-benefit

analysis for sustainable development. Policies for research and development, however, always require the commitment of substantial resources for their implementation. Clearly, a regional approach and, better still, an international approach, offer the best opportunities for reaping economies of scale in this high-cost endeavour.

The areas of priority for research and development in the region may be divided into three broad categories.

The first is similar to that facing almost every other country and reflects the dynamics of the global pattern of production specialization and consumption:

- the so-called "end-of-pipe" technologies that focus on cleaning up production processes currently in use, particularly for the region's major extractive industries and sugar manufacture;
- technologies that seek to promote low wastage and better yields per unit of energy and raw materials input;
- biological engineering;
- technologies that seek to develop alternative forms of energy, especially the region's sun and water resources;
- technologies that seek to reduce the prevailing levels of toxicity in foodstuffs consumed in the region; and
- innovations in consumption patterns and life styles that promote sustainable patterns of development.

The second emanates more specifically from the region's resource configuration:

- forest management;
- hillside management;
- more effective use of arable lands through more appropriate farming practices and technologies, the sustainable integration of farming into livestock, aquaculture and forestry management—this would include related fields such as soil conservation, pest and disease control, etc;
- water management, especially the drainage and irrigation of low-lying coastal and river areas that receive a lot of rain, and protection from hurricanes, floods, drought, etc.;
- the protection of beaches, coastlines and the headwater areas of rivers that run into the sea.

The third includes those issues that feature major concerns of the global community, (e.g., nuclear power, the use of CFCs, ocean resources, etc.). While the region lacks the resources to contribute significantly to research and development in these areas, it, nevertheless, has a long-term interest in global development in the

field and must, therefore, develop a basic capacity to keep in touch with global changes.

The above list is not intended to be exhaustive. Nor, it might be added, does it pretend to be anything more than illustrative of the research and development considerations that should enter into the economic policy framework discussed in this paper. Obviously, an inclusive list can be formulated only after far more detailed consultations have taken place on areas of priority. Two brief observations, however, should be noted here. R&D policies require substantial resources for their effective implementation. Securing these must, therefore, be given high priority in the transition to more sustainable forms of development. Also, the list reminds us of the on-going need to see the process of sustainable development in holistic and systemic terms.

The Macroeconomic Framework

It is commonplace to refer to the strategic importance of macroeconomic policies in providing the incentives and rewards needed to encourage economic units to move to more sustainable economic behaviour. It is also important, however, not to isolate the macroeconomic framework from the long-term behaviour of the region's economy, as this conditions macroeconomic manifestations. Good examples are the patterns of substitutability between basic categories of resources; special difficulties with environmental resource valuation; and distribution of income, wealth, access, and control of the region's resources. The latter in particular emphasizes the links between economy and society, and between being "fair to the future" and long-term equitable social arrangements.

Unfortunately, the long-term behaviour of the region's economy is such that two critical problems affect macroeconomic management in the region. One is excessive preoccupation with "sustained," short-term disequilibric, and the management of adjustment programs that have biased governments' economic policies toward accelerated rates of resource draw-down. In the absence of effective environmental planning and safeguards, it can be assumed the environment-resource-economic relationship will deteriorate. Second, the exchange rate and monetary and fiscal mechanisms have created distorting exchange relations between the region's major economic sectors as well as between its productive factors. These distortions, in turn, distort environmental sustainable development costs. Thus, over valued exchange rates penalize agriculture and subsidize industry, thereby reducing incentives for conservation practices. A similar effect can be seen in the operation of marketing boards and price controls on domestic food supplies. At the same time, favoured tax breaks have facilitated increased rates of resource depletion.

Enhancing the region's capacity to change depends, in part, on the elimination of impediments to change. Macroeconomic policies require the systematic identification and removal of subsidies, and preferred access to credit and foreign exchange, to those enterprises engaged in resource depletion. It also calls for the elimination of tax programs that do not tax resource depletion. Thus, an energy price regime that encourages the profligate use of energy, without regard for energy conservation, should be eliminated. Experience elsewhere shows elimination of negative macroeconomic policies is cheaper in the long run than trying to correct them sometime in the future.

The don'ts have to be combined with the dos. Thus, fiscal, monetary and exchange-rate mechanisms should provide positive incentives for research and development as well as for adoption of environmentally sound practices. Resource-based activities should be taxed in a manner designed to recover resource rents for the community. Or, again, agricultural prices should be allowed to reach levels that support sustainable farming practices, such as replanting and soil conservation. Agricultural policies are needed for pricing and access to foreign exchange, as well as for such socio-political issues as land reform and an improved social and economic infrastructure. Taxes on housing and tourist accommodation should generate resources from developers to secure protection of the natural environment.

There remain other incentives that the economic policy framework might incorporate:

- encouraging and rewarding enterprises that are environmentally friendly, either through public accolade, preferred access to foreign exchange, credit, etc., or tax breaks;
- enforcing, through a system of penalties for default, effective declaration of product content on labels (e.g., recyclability, biodegradability, energy use, etc.);
- adopting the practice of "the polluter should pay."

What I advocate is consistent with Jim MacNeill's suggestion that over the long-term a shift in the trend of taxation is being called for, "away from labour income, savings, and investment—to energy, resource use, products with a high environmental impact and pollution."

Institutional - Organizational

This paper is not intended to cover institutional and organizational matters. A brief discussion of the subject, however, is necessary to highlight aspects of the management frame that might encompass

economic policy formulation. In managing environmental and economic policies, it is important to avoid locating environmental concerns at the downstream end of the development cycle. The case has been well made for its upstream location. Achieving this requires an integrated treatment of economic and environmental issues beginning at the pre-project stage of the cycle, when options are being raised.

A number of government environmental agencies of varying significance already exist in the region. Environmental concerns form an important part of non-governmental organizations' agendas as well. Together these would seem to contain the nucleus for a substantial upgrading of environmental concerns in the region's development. However, these need to be structured in a framework that would facilitate data gathering, expert evaluation, public comment, and the eventual implementation of policies. A significant feature of such a framework would meet the criterion of facilitating world-wide standardization of information and practice. Six guidelines, from the Report of the U.N. Economic Commission for Europe's Committee, seem to offer a useful starting point for the region's management framework:

- Problem Assessment. This would cover, inter alia identification of key problem areas in a broad inter-disciplinary framework.
- Information Requirement. This would emphasize data collection along the lines indicated in the problem assessment. Routinely, it should involve major players in the region: government officials, professionals, enterprise managers, unions, farmers' organizations, NGOs, etc.
- Development of appropriate analytical instruments. This would include model building, improved evaluation techniques for environmental impact assessment measures, and so on.
- Priority setting. This refers to setting of priorities using the principle, "all problems in society cannot be simultaneously attended to."
- Selection of the main policy instruments. These should be established under the headings: regulations, directives, economic incentives, promotion of alternative technologies, information dissemination, education, etc.
- Administrative and institutional arrangements. These should ensure that public bodies are established with full powers to enforce environmental standards and to oversee insurance and other compensatory arrangements when damage is incurred. They should also establish a full and effective networking of regional agencies, especially those operating in the area of research and development.

In conclusion, it should be reiterated that the policies proposed call for commitment of public resources. This is a major problem with limited regional budgets. Failure to resolve it would threaten the transition to more sustainable patterns of development.

The International Dimensions

Since the concerns of sustainable development are universal, solutions pursued only at the national and regional levels would be insufficient. The transition to sustainable development is ultimately a global process, and the economic policy framework has to take this into account. At the heart of the process there must be global rearrangements in the organization and use of resources, the conduct of international trade, finance, capital and labour exchanges, and the resolution of conflicts. The reasons for this conclusion are many and well established: environmental pollution does not respect national boundaries; some environmental problems are global in magnitude (e.g., the ozone layer); while many others fall under the rubric of collective action to support the "global commons."

Frequently, environmental controls in one country or group of countries benefit others, even though the costs are not equally shared. In addition, it is clear that varying levels of taxation and subsidies on environmental inputs to goods and services traded internationally affect costs and, hence, the distribution of production among countries. Such examples indicate that without uniform approaches and a concerted global effort, the transition to sustainable development will not be achieved.

There is another aspect to a concerted global approach. In the region, as in many other parts of the Third World, there is considerable evidence of double standards in economic enterprises. Safety, pollution and other safeguards in production facilities located in the South are inferior to those used by enterprises operating in the North. Similarly, the sale of polluted products, by both transnational and locally owned companies in the South, continue despite the existence of legal prohibitions in the North.

The international aspects have to be established in a context where decision-makers in the region are conscious of the impact past and present inequalities (of income, wealth, and productive activity) have had on the present state of environmental degradation and natural resource depletion. The wealth of the North has been based on the exhaustive use of resources, while the poverty of the South has created environmental stress because people, desperate to survive, favour the present at the expense of the future.

This asymmetry, combined with an apparent threat to the global habitat in some areas, has raised the issue of the negative

power of the Third World. The worst interpretation of this is seen as a power/capacity "to hold to ransom" developed countries by refusing to adopt measures that are aimed at global control in life-threatening situations, unless they are compensated for the retardation of their own development, or for the higher costs that would be incurred if they supported control measures at the global level. More constructively, this asymmetry lays the basis for leverage that would secure the developed world's participation in programs of global redistribution aimed at the permanent eradication of poverty. This approach invokes the self-interest of the North.

The negative power may well be illusory. Some argue this is implied in the smooth and rapid manner in which the North was recently able to secure the implementation of a number of environmental agreements in "the pro-South, United Nations forum." First World leverage may well be stronger since it is strategically placed to enforce "environmental conditionalities" through bilateral and multilateral trade, aid and financial transfers between the two regions.

With regard to the economic policy framework, four key policy recommendations emerge:

- The region should support placement of the environment-resource-economic relationship at the top of the global agenda. Disagreements over the severity of specific claims (e.g., global warming, species extinction, etc.) should not let us lose sight of the broader objective.
- The region should also support consolidation of the gains already made. Here I refer to support for implementation of standards agreed to internationally. This would require support for strengthening the monitoring and enforcement mechanisms. Support should also be given to the research agenda developed under the aegis of these concerns. The regions should also adhere to treaties dealing with toxic waste, the CFCs and Antarctica, and should also seek to ensure their periodic upgrading.
- The region should avoid the degeneration of these issues into ideological and geo-strategic concerns. From this standpoint the tendencies to exploit negative power, or for externally imposed environmental conditionalities, should be resisted. It is better to support the counter-strategy that links capital flows from the North to the South, and links more equitable trade and human-transfer mechanisms to the application of scientifically determined, consistently-applied environmental standards in all countries.
- Soon, decisions will have to be made to go ahead in favour of a coordinated national and international system of taxes and

subsidies to support the transition process. Given the resource inputs required to secure this transition, it is in the interests of the region to support the development of an equitable tax structure.

In conclusion, it should be mentioned that delays in arriving at a global consensus should not deter efforts to develop regional and national programs. However, these efforts would be under-financed and run the risk of failure.

Social Issues

Concentration on the economic policy framework is not intended to diminish the need for a central inter-disciplinary approach to sustainable development. Sustainable development should be seen to encourage and ensure that people are consciously and determinedly responsible in exercising stewardship of their patrimony. In keeping with this, a number of social issues are raised that are critical to the successful implementation of an economic policy framework.

Poverty

Historically, the dominant rhythm, or logic, which has driven the region's development, has not been anything close to a vision of sustainable development. Traditionally, imprudent use of resources has been the order of the day. Moreover, both in territories where recent growth has been rapid, and in those where structural adjustment programs have been the norm, this process of imprudent use of resources has been accentuated. In the former, this has been through under-costing of resource and environmental inputs and, in the latter, because contractions in income have placed a premium on immediate survival. This tendency to imprudent resource use has also been reinforced by growing inequalities in distribution of income, wealth and access to resources, which have characterized recent experiences in the region.

Generally, we find regional development programs and policies are not geared to a systematic attack on poverty. Rather, it is expected the eradication of poverty would trickle downwards as part of the benefits of growth. This incidental approach to poverty is mirrored in the failure everywhere to collect systematic and routine data on such basic social indicators as income and asset ownership and distribution.

Neglect of data collection in the rural sector, at a point in time when numerous unsustainable practices are rapidly emerging, reflect: diversion of farmlands to narcotics, reckless use of marginal lands,

deteriorating drainage and irrigation systems, and destruction of the feeding habitat of indigenous and isolated communities.

Because poverty is probably the most important single factor behind unsustainable practices in the region, and is the biggest obstacle to changing these, its eradication is clearly a priority. This suggests the need for basic anti-poverty programs as part of the economic policy framework, even in situations where they seemingly run counter to the objectives of structural adjustment programs. These poverty programs should focus on such key areas as land reform (the provision of land to the landless farmers), and unemployment, (especially among women and youth). These programs should also encourage a greater focus on local and community self-financing and self-management of resources, and for generally greater participatory decision-making structures. They should also allow for greater transparency in making economic policy choices.

Awareness

Being "fair to the future" will not logically, or automatically, emerge out of the region's economic system. The imprudent use of resources is profitable to enterprises and convenient for financially strapped governments. A key element in economic policy formulation, therefore, has to be programs that enhance public dialogue and awareness of the issues involved. The dialogue has to be targeted at all levels, policy-makers, managers of economic enterprises and activities, as well the individual and household sectors. Certain institutions will also emerge as being very pivotal to this process: the media, schools, universities, unions, employers and business associations, professional bodies, and NGOs, especially those catering to the needs of women, youth, church, co-operatives and the environment. The program of dialogue should not, however, be perceived as an exercise in public relations. Rather, it is being advocated as part of a program geared to raise public consciousness of these issues on the basic premise that it would contribute to sustainable political and social practices in the region.

Women

There are two key aspects of the multi-aided relations of women to the environment, in a transition to patterns of sustainable development. The first is derived from the exceptional roles that women play in the region's economy. Although treated as a minority, women form the majority of the region's producers and, at

the same time, carry special social responsibilities for the reproduction of the labour force. Chief among the latter is they constitute the majority of household heads. Women's work also is the principal source of under-reported, unrecorded and underpaid labour in the region. On close examination, it is also evident that women interact extensively and intimately with the natural environment of the region, and because of their many social roles, women may well be more caring and nurturing in their attitudes to our habitat and, therefore, more likely to exercise responsible stewardship of the region's resources.

Therefore, transformation of the environment-resource-economic relationship in the region would be contingent on increasing gender equality in economic life, giving a far greater role to women in the articulation and execution of programs than has been traditional.

NGOs

In the organisational and institutional development of the economic policy framework, NGOs have a special role to play. First, regional NGOs have played a significant role in identifying environmental abuses and calling for sustainable development. Second, NGOs have been able to do so from the vantage point of intimate contact with local communities. Supporting NGO activity at this stage, therefore, achieves a number of desirable objectives. It widens the basis of the constituency in support of sustainable development. It mobilizes groups that have intimate contact with the end effects of environmental abuses, and so enhances the quality of support. And it brings into play groups of people strategically placed to both assess damage and to monitor corrective policies.

Population

For a variety of reasons, population policy has gone into decline in the region. Yet population movements (migration and urbanization) and levels of utilization (employment-unemployment) remain crucial considerations in the region's environment-resource-economic relationship. It seems that now might be opportune to re-open the dialogue on these matters, particularly as the regional integration process may soon have to examine such issues as population resettlement and free movement of labour.

A few general observations are pertinent. While policies for sustainable development are premised on inter-generational transfers, it does not necessarily follow that incentives and penalties that flow from policy should focus on the long term, either principally or exclusively. The economic policy and management framework has to

embrace the full spectrum, from the long term to the immediate day-to-day issues. A continuous planning horizon and mechanisms that are sensitive to links between long-term, medium, short-term, and immediate policies will, therefore, have to be forged.

To be effective, economic policy has to be purposeful and change and equity oriented, while placing the fulfilment of basic needs and the eradication of poverty high on the agenda of its priorities. Unless this is done, there is a real danger that large sections of the region's population, and, indeed, some countries themselves, might well see in this effort designs aimed at reinforcing their impoverished status in the economic, social, political and cultural life of the region.

V. CONCLUSIONS

The evidence worldwide is clear. Nearly two decades after the Stockholm Conference on the Human Environment and the formation of the World Commission on Environment and Development, sustainable development is a concept whose time has arrived. This very timeliness, however, runs the risk of its becoming seen as yet another fashionable policy fad. For instance we find major global institutions and key players on the world scene have been late in perceiving and acting on theses advanced by theorists in this field and this adds to the threat of "faddism."

Previous popular development policy options focused on a very limited number of variables: population, human resources, industrialisation, science and technology, import-substitution, etc. In this case, however, sustainable development is presented in some quarters as a single, holistic, inclusive and universal, organizing principle. While this avoids the narrowness of the single focus of earlier options, it runs the danger of being too transcendental (that is, of seeming to provide all answers to all questions). Also, the very large variety of disciplinary specialisations that the concept encompasses poses the danger of fragmentation from within, since human experience in truly inter-disciplinary research design and implementation has been limited, and not altogether very successful. The road ahead, therefore, contains pitfalls we should be aware of at the very outset.

Sustainable development focuses on the ultimately limiting nature of the natural environment. It emphasizes the finite dimensions of natural resources. Emphasis should also be placed on human resources, which are unlimited and which, in fact, grow in efficiency through use—co-operation and participatory activity, for example. The spirit of co-operative endeavour is not a limited, exhaustible fund, but is a resource that becomes more useful, the more it is used. In other words, it has the capacity of indefinite

renewal. A linkage of these considerations to the economic theses of sustainable development has to be made, not only at a theoretical level, or as an abstraction, but as part of the practical vision that is applied to construction of an economic policy framework.

Because of past abuses, many in the South and in the Caribbean region remain highly sceptical of the North's motives. There is fear that the North's motives are not disinterested and, in seeking to preempt the South's claim to global resources, they are hoping to maintain their own life styles, rather than relieving environmental stress. Similar attitudes helped to derail the region's "population policy" programs in the 1960s.

The only way that such fears can be overcome, or, indeed, prevented from being actualized, is to establish from the outset that being "fair to the future" is only possible if we are also fair to the present. There is, in my judgement, no other way forward.

PART II

Resources Management and Development

Part II — Resources Management and Development

Introduction

Achieving sustainable forms of development within the Caribbean region is dependent upon the extent to which policies and practices enhance the management of its natural resource base and facilitate adjustments to more sustainable forms of development. To address this management challenge in detail, four panels were convened on day two of the Conference. The following sections are essentially a sequential and synoptic report of proceedings for each of the panels and illustrate the breadth and scope of these working sessions.

Land and Freshwater Resources

During this panel session, participants were asked: "What shifts in agricultural, forestry and urban management policies and practices are required to protect, preserve and enhance land capabilities, land use and freshwater supplies as well as reducing the impacts of hurricanes and coping with potential climate change?" Issues that dominated presentations and subsequent discussions included climate change, water and land resources management, urban development, agriculture, forestry, human resources development, integration of planning and management of various sectors, and technology and information for developmental planning and management and for increasing awareness.

Land and fresh water are critical and scarce resources in most Caribbean countries. Many current economic activities use these resources intensively, and pressures on them are increasing rapidly. In an era of scarcity, it is imperative that policies governing the

utilization of these resources, developed in an era of relative abundance, are assessed and revised, as necessary. One of the most important issues to arise out of the discussions is the multiplicity of institutions and jurisdictions that deal with various aspects of the use and management of shared water and land resources. These institutions often develop and implement policies and programs in isolation of each other, with the result that some of their activities become counterproductive, or they undermine the ability of other sectors and institutions to achieve their own goals and objectives.

The issue of climate change was raised by a number of participants in this session. While the major consequence of potential climate change to the Caribbean would be sea-level rise—because of the importance of its coastal and marine resources—it was recognized that any increase in the frequency and intensity of hurricanes and precipitation would be significant for land-based activities, particularly forestry, agriculture (including livestock and pasture), human settlements, water supply and waste management.

With respect to forest ecosystems, climate change may affect logging, fuelwood availability, recreation, hydrology, biodiversity, soil erosion and sedimentation. Agricultural impacts may include soil depletion through increased erosion and reduced organic matter content, and pest proliferation as a result of changes in heat and humidity regimes. Higher concentrations of atmospheric carbon dioxide may stimulate plant productivity through increased photosynthesis and water use efficiencies and saline intrusion in low-lying coastal areas may adversely affect production of traditional crops or varieties. Nevertheless, the opportunities to adapt cropping and other agricultural activities to climate change are far greater than for forestry. With respect to human settlements and waste management, impacts will be determined largely by whether communities undertake proactive, adaptive or reactive responses.

For water supply and management, it is anticipated that climate change would bring about a significant increase in frequency and intensity of extreme-value hydrologic events throughout the region. Surface water supplies may be augmented, but this could be offset by increased sedimentation and rapid run-off and, possibly, increases in pollution from soil and chemicals. Although ground water aquifers may be recharged adequately, this may be accompanied by increased risks of water pollution.

In addition to reinforcing the potential impacts of climate change, Thorant Hardware, whose paper is reproduced at the end of Part II, stressed the threat to effective water resources management through short-term economic pressures.

> ". . . the pressures to restructure and service the growing national debts have forced governments toward short-term expedients involving the rapid and often unplanned exploitation of national assets. . . . Land and water resources are major constraints to this politically attractive aspiration for instant development. This new economic imperative puts a great deal of pressure on natural resources because of increased activities in agriculture, forestry, mining and quarrying, industry and tourism. Water resources will be a major casualty in the pursuit of rapid development at all costs."

There was strong support for the notion that the role of water as a crucial component of socio-economic development be defined and that a consistent and coordinated policy at the national level be established. Other priorities included elaborating water resources master plans, defining water management objectives and developing mechanisms for public awareness and participation, and promoting integrated water resources management. The potential for legislation to support planning and management efforts was stressed, as was the need to define individual components of the management system, delineate their respective responsibilities, provide necessary coordinating mechanisms, and establish limits to user rights. As Hardware noted,

> "[The immediate objective for water resources management for sustainable development is] to reorganize, rationalize and strengthen resident agencies and to integrate water resources management into the national development process. . . . Poor coordination has been a principal constraint to increasing effectiveness of water development efforts in the region. One major tool that will increase institutional coordination in the water sector is a common, accessible and accurate water resource database that can support rational decision-making. Such a water resources management information system should . . . provide a basis for strategic planning and rational operational management of the region's water resources."

Land, like freshwater, is both limited and ecologically fragile in the Caribbean, and yet it is not managed to reflect these constraints. Gloria Knight and Jacqueline daCosta, in their paper on urban development and management, noted,

> ". . . the need to control land use has not been effectively managed. Pressure for approvals to use land for

> manufacturing, industry, tourism, and for expansion of urban settlements continues to be strong, partly because decisions on the use of land are often made by politicians and bureaucrats without due attention being given to planning and environmental considerations. Such decisions need to be taken within the ambit of integrated . . . developmental plans that enable administrations and politicians to make decisions based on cost-benefit analyses, into which is factored environmental criteria.
>
> "In no other sector is the need for sustainable development so great as in the urban sector. In urban areas, especially in the major cities of the Caribbean, governments need to respond to the pressure points of shelter, employment creation, food supply, water, waste disposal, energy, transport, health and social services. All of these pressure points can be dealt with only in the framework of integrated planning, well-organized implementation of such plans and high-quality management of cities."

It was agreed that urban management is a critical and underrated element of environmental policy in the Caribbean. Growth rates in large cities are higher than at the national level, and major cities are growing faster than governments can provide physical and social infrastructures for additional populations. Many of the poor feel they are better off in cities, where they are close to amenities such as employment, physical and social infrastructure, entertainment and opportunities to improve the quality of their lives, as well as that of their children. Nevertheless, the potential to benefit from these amenities has been limited. As Knight and daCosta pointed out,

> "The lack of proper management in most of the territories is reflected in the polluted environment and decay that is characteristic of urban areas in the Caribbean. Projects aimed at developing cities are sectorally organized with little coordination, and services provided are often also carried out by government agencies that do not relate to each other."

It was stressed that urban developments undertaken with insufficient prior assessment can cause water, noise and air pollution and may impose unanticipated burdens on waste management, sewage disposal and potable water infrastructures. Many agreed that some types of development have been implemented to meet stated needs of individuals and developers without sufficient regard to

broader societal goals. To guide development, and also to reduce the potential for "political override," it was recommended that comprehensive land policies, which would address not only use, but also conservation, disaster preparedness, access, ownership, tenure, taxation, pricing, management, acquisition and divestment, be developed and implemented. As with freshwater management, policies that more effectively delineate the responsibilities of different management institutions and that help rationalize and improve inter-institutional coordination are also required. The latter should ensure that scarce professional and technical skills are more effectively employed. It should also facilitate integration of the planning and implementation functions. As Knight and daCosta stressed,

> "Governments need to recognize the need for an integrated approach to planning and development. Planning organizations should work with a variety of agencies to ensure that what is proposed takes into account not only the economic but also the social, spatial, environmental and technological aspects. Institutions should be strengthened to plan and implement developmental programs and projects as part of the process of managing urban growth.

Several participants pointed out that institutions responsible for spatial planning need to be retooled and re-educated, and that economic planning must be supported by spatial planning and information. Many agreed that facilitating land ownership would reduce pressures on marginal lands for urban expansion and for other purposes. It was also suggested that ministers of physical planning should meet at the Caribbean regional level, possibly with ministers responsible for the environment as well, to address the issues and challenges of sustainable development. Knight and daCosta also noted the importance of facilitating public participation and generating support for developmental initiatives at the community level.

> "In recognizing the need for integrated planning, governments should make a greater effort to obtain public participation in their planning and developmental activities. They should harness the energies that abound in the formal sector, while at the same time capturing the ingenuity of the informal sector, and use their scarce funds to facilitate suitable and sustainable development. People should be allowed and encouraged to do those things they can do for themselves (i.e., building a shelter), while

> government does those things that cannot be done by individuals (i.e., infrastructure). Governments should strengthen the self-help capacity of the urban poor, and find ways to enable them to participate in contributing to and improving their habitat."

In this context, the need for governments to identify and develop lands with basic infrastructure in order to improve access by lower income groups to residential, commercial and industrial activities and services was highlighted. Suitable tenure arrangements and affordability were also identified as being essential if squatter settlements, usually sited on marginal lands subject to the ravages of natural disasters, are not to continue to be the habitat of the urban poor.

> "Shelter is a particularly critical issue. In many countries in the Caribbean, over 70 per cent of the urban population are unable to buy conventional houses. This is due to scarce and expensive financing, use of imported technologies, unavailability of land, and standards and regulations that prohibit the participation of this group in the formal housing market. Accordingly, the poor provide their own shelter—usually on lands that are not suitable for this purpose."

To finance major infrastructure projects that are environmentally sound, there was general endorsement of the need for governments to charge realistic fees for services and to invest in staff, and the operation and maintenance of facilities. Several suggestions were made to address this need. One was introducing infrastructure and services on an incremental basis in order to reduce the immediate need for large, initial capital investment. Another was a system of tax credits that encourages private-sector organizations to undertake developments that take into account environmental and natural resource considerations. The adoption of realistic fees and taxes to finance project development and maintenance according to certain standards was also highlighted.

This latter suggestion led to a call for the Caribbean Uniform Building Code (CUBIC) to be updated, where necessary, and implemented. Particular emphasis was given to the need for standards that are realistic, comprehensive, affordable and that can be met by the majority of urban dwellers. Legislation that ensures these standards are enforced and that facilitates rational planning of physical resources, and environmental protection was also identified for priority attention.

The need to share data that is collected by various ministries and agencies through computerized networks of land information/ geographic systems and digitized maps appropriate to the Caribbean region was also stressed. This would not only ensure more effective and available data for use by agencies responsible for taxation, pricing services, infrastructure provision, land registration and so on, but would also reduce current duplication of effort in this field. A related matter is that of technical assistance. Where this is offered, priority should be given to institutional improvements, providing specific operational personnel, buildings, computers, typing and word processing facilities, photocopying machines, and materials for use in carrying out a work program that can make a major difference in output. Professionals from the region should be involved in any technical assistance exercise, to ensure there is sensitivity to local problems, and that there is funding commensurate with the full costs of implementation, management and maintenance.

The historic and continuing linkages between various types of land and resources utilization and sustainable development are exemplified by agriculture and forestry. For example, during the 17th and 18th centuries, the focus on cane production and the subsequent settlement in the interiors of islands brought about a cycle of deforestation; soil erosion; declining soil fertility; overcrowding; subdivision of holdings; and, further deforestation. This cycle of deforestation and of soil loss continues today in many countries in the region. In Jamaica, the annual deforestation rate is estimated to be 3.3 per cent, with 400 million tonnes of soil loss due to watershed erosion on the island from 1981 to 1990. Much of the soil makes its way to the sea, where it chokes coral reefs and hurts valuable marine fisheries. These figures provide some indication of the impact that agricultural practices are having on forests, watersheds and marine environmental quality. In his paper to the plenary on economics and sustainable development, Norman Girvan noted,

> "We cannot say how far these conditions are generalized across other Caribbean islands and the mainland countries. However, even if they are partially representative, they indicate that the issue of sustainability in relation to soil, timber and water resources is an immediate and pressing one. If ignored, this will give rise to rapidly mounting economic and social costs—more frequent flooding and drought disasters; declining productivity of the land; growing import demand for food, fuel and timber; and increasing malnutrition."

These and other interrelationships were reinforced by Carlyle Mitchell in his paper to the closing plenary. In his discussion of

agriculture with respect to the island economies of the OECS region, he noted that it,

> ". . . has caused considerable problems for the environment due to land use practices and the extensive use of chemical fertilizers. Since most of the arable lands are used up, particularly in the Windward Islands, increased agricultural production has been brought about by the use of sub-marginal lands, often at the expense of reducing forest resources, which in turn affects the quality and pattern of rainfall. Increasing quantities of herbicides and pesticides have resulted in polluted aquifers, surface water and soil; while in some cases inadequate use of fertilizers has depleted soil fertility."

Despite these issues, agriculture continues to be a major contributor to socio-economic development in the Caribbean, and indeed, for some countries it is the most important productive sector. The fact that coherent agriculture and land-use policies have not been pursued by most Caribbean governments, with the consequence that agricultural land has passed into other sectors such as housing and tourism, was identified as a major cause for concern. Food aid was identified as a contributor to this relative neglect of agriculture. As Helen McBain noted during her presentation in the opening plenary,

> "Because of the low cost of (food aid) items and the political gains to be made by providing the electorates with cheap food, governments have not seriously pursued agrarian reform. The availability of subsidized items such as milk, rice and corn suppresses producer prices and, hence, provides a disincentive for import substitution. . . . Food aid to the region has also been targeted at production of cash crops in commercial and capital-intensive operations, rather than at projects that would directly improve the condition of the rural poor. Again, aid donors have been more concerned with assisting agricultural production that could benefit their economies than the economies of the less-developed countries."

The need for agricultural reform focused on improving the conditions of the rural poor and strengthenning backward and forward linkages between agriculture and other sectors and industries in order to meet local needs. Drawing from a recent study commissioned by the OECS Secretariat, Mitchell stressed that,

> "OECS member states should reduce their dependence on bananas by means of agricultural diversification and greater diversification of their economic structure. The environmental implications of this scenario are interesting: reduced banana production, by concentrating on the most productive areas could reduce environmental degradation caused by forest encroachment and by the extensive use of sprays and pesticides; tourism development, with changes in tastes toward more nature oriented activities, will require improvements in the environment."

Throughout the discussions on agriculture, there were several recurring themes for action. The need to strengthen the linkages, including inputs, between the agricultural system and other sectors was stressed, as was the need to emphasize regional markets, including the potential for indigenous species development and integrated pest management. Policies that encourage small farmers to grow high-priced crops to pay for inputs and large landowners to concentrate on the production of lower-cost products were also recommended. With respect to research and development, there was strong support for increased attention to adapting agricultural technology to the region and to better organizing field extension and training support for farmers. The need for mechanisms that would enable farmers to influence these and related macroeconomic policies was highlighted.

The fact that the ecological and economic bases of agricultural development were dependent on the existence of natural forest vegetation led to further suggestions. For instance, to reflect this relationship, agricultural and forestry policies must be blended not only in the area of agroforestry, but in the development of policies that will prevent uncontrolled grazing on forested areas and the expansion of illegal squatting activities on agricultural, forested or marginal lands. In addition, forests should be protected, particularly in upper watersheds, and managed on a sustained-yield basis. Some felt that the under-utilization of large areas of state and private land provides foresters and agriculturalists in the region with a great challenge. As Dan Chalmers noted,

> ". . . With ever-increasing areas of traditional crops, such as sugar, cocoa, cotton and coconuts coming out of cultivation because of market forces, the region simply cannot afford to have its two major resources (land and people) lying idle. . . . Starting from the premise that all land, state or private, is held in trust for future generations, it is clearly unacceptable for either party to misuse or under-utilize such a resource, which, by

definition, must be managed wisely to ensure the concept of sustainability. With populations and unemployment mounting inexorably and food importation bills going the same way in several countries, there is an urgent need to develop practical mechanisms to ensure that any parcel of land in excess of five hectares is put to productive use for crops, livestock, forestry/agroforestry.

"In getting to grips with the problem of idle or underproductive land, there is, undoubtedly, tremendous potential for the implementation of agroforestry techniques on a wide scale. Agroforestry involves the growing of agricultural crops (often fruit tree species) in conjunction with timber tree species. Alternatively, it could involve the grazing of livestock (cattle and small ruminants) under timber tree crops. The judicious combination of forest trees, fruit trees and livestock provides an excellent opportunity to: increase agricultural production per unit area; establish on a significant commercial scale for international marketing several first-class fruits that virtually grow like weeds in the Caribbean (i.e., mango, guava, sapodilla, soursop, carambola, West Indian cherry and cashew) and whose potential has been ignored for so long; increase local food and timber production; provide much needed employment; and, above all, provide the financial incentives to get the private landowner into forestry development."

For the Caribbean region, Chalmers listed several direct benefits provided by forests. These included sawn timber, poles and posts, wood pulp for paper, firewood and charcoal, fruits and bark for tannin, handicraft materials, natural products such as bush teas and insecticides, fodder and grazing for livestock, the potential of unique genetic plant resources, meat from hunting, and employment for rural populations. While it was stressed that, in strict monetary terms, the values derived from these direct forest benefits may not be large in most countries, there is, nevertheless, considerable potential for increasing these values and, at the same time, saving scarce foreign exchange spent on timber and wood products from North America by increasing intra-regional trade.

In addition, Chalmers identified several indirect, yet critically important, benefits provided by forests. These include the prevention of soil erosion and flooding, ensuring the supply of pure water, habitat for wildlife, ameliorating climate conditions, storing and recycling plant nutrients, and maintaining levels of soil fertility and

agricultural production. The aesthetic values of forests and their potential for recreation and nature tourism were also stressed.

Many agreed that the need to quantify these benefits in economic terms, in order to facilitate their rational utilization, is urgent. As Chalmers pointed out,

> "The failure to quantify the value of the indirect benefits accruing from our forests has been a major handicap and has no doubt contributed to the all too frequent . . . destruction of our vital, protective forest cover. In most countries in the region, the value of the indirect benefits far outweighs the value of any raw material likely to be harvested. It is ironic that the true appreciation of the indirect benefits comes only after the forests have been destroyed, with the inevitable onset of a vicious cycle of soil erosion, landslips, destruction of roads and coastal defences, siltation of streams and river beds, flooding alternating with severe decline in agricultural production, decline in rural employment and income, exodus of rural populations to exacerbate the urban crisis in terms of increasing pressure on existing housing, education and health services.
>
> "Few, if any, systematic studies have been made of the high costs resulting from this ongoing forest destruction (i.e., the almost annual serious flooding of the Caroni Plain in Trinidad; the high cost of regularly dredging silted-up streams, reservoirs and dry rivers; the actual replacement cost of the crops and livestock lost through flooding; or the provision of truck-borne water during severe, unseasonal droughts), but the social costs and disruption are always horrendous."

It was suggested that a priority for all countries is to prepare an up-to-date national forest policy to meet national needs in terms of production and forestry protection. It should embrace all related issues such as water supply, wildlife and national parks. Once a forestry policy has been approved and adopted, it must be supported by suitable legislation to ensure implementation relevant to both forests and forestry development on private lands. The legislation must address the serious problems besetting forestry throughout the region regardless of political implications or sensitivities. Chalmers provided the following example:

> "In many countries in the region the widespread destruction of forests in key upper watersheds and the

> serious impairment of water supply and quality has now reached crisis proportions. Some countries have to import water to meet the increasing needs of the tourist trade, whereas well-forested Dominica is now developing an export trade in water. What is significant is that the destruction of much of the forest is not only caused by shifting cultivators/squatters, but is in response to official agricultural policies. It would be naive not to recognize the major contribution the cultivation of bananas has made to the development of the economies in all four Windward Islands. To the banana farmer, with his regular weekly or fortnightly pay-cheque, bananas have, undoubtedly, proven to be the most reliable, lucrative crop ever grown in the West Indies. Its undoubted success has inevitably led to the expansion of banana cultivation on unsuitable and marginal sites, with the consequent destruction of the natural forest and with increasinly unacceptable levels of chemical pollution arising from widespread intensive use of agricultural chemicals."

In addition to halting the destruction of depleted forest resources, all countries must implement reforestation programs emphasizing watershed management. It was suggested that the Caribbean region as a whole (including the South American mainland countries of Guyana, French Guyana and Suriname and Belize in Central America) could be self-supporting in timber, possibly in two to three decades, but this requires that coordinated reforestation and timber marketing programs be implemented by national governments.

In promoting the Tropical Forestry Action Plan, Chalmers emphasized the need for more efficient use of timber as a raw material, noting the waste of tropical trees through some current practices such as excessive felling, selective extraction practices and inefficient and inaccurate sawing. He added that termite attack is another form of waste that should be combated through the legal adoption of standard specifications for wood preservation treatment.

With regard to energy production, it was stressed that, it is important now to link forest protection to the establishment of extensive areas of fast-growing, short-rotation fuelwood plantations, if fuelwood and charcoal needs for the future are to increase. As a precautionary note, it was suggested that small-scale fuelwood species trials be adopted in each country.

In addition to assessing the real values derived from the direct and indirect benefits of forestry on both state and private lands, the need to develop innovative measures to raise funds specifically for forestry development was explored. Suggestions included a special

import tax on timber and wood products, and a watershed management tax for each gallon of water consumed for domestic and industrial purposes. To encourage private landowners to develop forestry and agroforestry enterprises, both on their own lands and in joint ventures using state lands, the need for incentives commensurate with those offered for tourism and industry projects was also suggested.

Certain of the agricultural and forestry recommendations outlined were identified for action at the regional level. These included education and training at the first degree and post-graduate level; research, development and extension; regional trade in agriculture and wood products, with special emphasis on the timber resources of Guyana, French Guyana, Suriname and Belize; a regional or sub-regional professional forestry service; preparation and implementation of public educational programs for all age groups; and harmonization of the classification of agricultural and forest products statistics for customs and other purposes.

In terms of education and management, the point was made that all peoples must be made aware of the impacts of their activities and decisions on the productivity of land and freshwater resources. Particular attention was given to the need for community-level action, since it is there that people know how best to understand, appreciate, respond to and manage their local environments. Similarly, management practices should accord increased attention to, and take advantage of, indigenous skills and local knowledge about the natural resources characteristics and peculiarities of the hinterland. Finally, it was recommended, as in other panel sessions, that new and innovative ways of securing gainful employment, compatible with the resource base of the region, must be explored, and that this will require adopting different attitudes, including those held toward taking risks.

Marine and Coastal Resources

The Panel on marine and coastal resources addressed the following question: "What shifts in fisheries, tourism and coastal management policies and practices are required to protect, preserve and enhance the marine and coastal resources base, as well as reduce the impacts of hurricanes and coping with potential sea-level rise?" Issues that received considerable attention included the increasing pressures on coastal zones, waste production and management, climate change, the role of tourism in environmental and resources management, who should pay for the benefits resulting from the use of resources, the carrying capacity of marine and coastal areas, the role of zoning and land-use planning, mitigating threats to the fisheries sector, and

increasing the awareness and skills of those who use and rely for their incomes on the resource base.

Overall, there was a general consensus that, since the marine and coastal areas constitute such a large proportion of the productive resources of Caribbean states, factors that are adversely affecting their actual and potential role and contribution to national development must be more effectively addressed. As Clement Lewsey noted, from both current and future perspectives,

> "The quest for sustainable coastal development in CARICOM nations must be considered in conjunction with the development of integrated and coordinated coastal zone management. This approach is mandatory because of the intensive pressure growth and development imposes on the limited coastal zones of these countries. The problems of managing these intensively used areas are compounded by the conflict between demand incentives and the need for rational planning and development in the coastal zone."

> "Historically, mono-crop agriculture has been the major land-use activity in coastal areas, and at present still dominates coastal land use. More recently, agriculture has had to compete with other activities such as coastal tourism, port facilities, industrial development, airports, urbanization and local recreational activities. However, as the competition for coastal land intensified, agricultural activity has had to share, and in some cases relinquish, land to tourism activities and urban development. Similarly, the competition for beach and adjacent coastal lands between tourism, artisanal fisheries and local recreation has skewed land use in favour of tourism-related activities."

It was stressed that this competition among sectors has not only generated conflicts over the use of land and water, but has also contributed to the decline of traditional land and water-use activities. For instance, Lewsey noted that in many Caribbean countries, up to 70 per cent of the population live and work in the coastal area. He also cited examples of coastal industrial estates that, while generating other commercial activities and economic benefits, have systematically depleted local fishing industries. The same can be said for the impacts of agriculture on the marine and coastal zones. Here, the use of agricultural fertilizers and pesticides was highlighted as a major contributor to pollution in marine and coastal areas, which in turn has had a deleterious effect on marine ecosystems, as evidenced by fish kills and coral reef stress.

A further pressure on marine and coastal resources that received considerable attention was waste production and management. In many countries, there are mounting quantities of urban wastes being disposed of, either directly or indirectly, into the sea. Added to these are industrial wastes, wastes from tourism activities such as hotels and yachting, and wastes from the extraction, processing and transport of petroleum products.

Compounding these pressures on marine and coastal environments is the prospect for added adverse environmental impacts resulting from climate change and sea-level rise. In his background paper *Potential Climate Change and Sustainable Development in the Caribbean*, Naresh Singh noted,

> "Impacts could include inundation of low-lying areas, increased beach erosion, damage to coral reefs, sea-grass beds and mangroves, and consequent removal of natural coastal stabilization factors and vital nurseries for harvestable living resources. Some adaptation by these systems is possible. Some coral reefs might be able to grow and maintain their optimal depth below sea-surface. New migratory trends, spawning patterns and recruitment efficiencies could affect fish catch. Recreational water quality could be affected adversely. Threats to coastal infrastructure such as roads, ports, industrial facilities and residential and commercial structures could result."

Leonard Nurse, whose paper is reproduced at the conclusion of Part II, indicates that if predictions of a 20 cm. rise in sea level by 2025 do materialize, severe coastal erosion would be a distinct possibility. This, Nurse asserts, along with the increased competition for scarce coastal resources and ongoing destruction of coastal resources, which are highly valued for tourism and other economic developmental strategies/sectors, has yet to be given sufficient recognition by resource management and planning institutions.

The pressure on marine and coastal resources, stemming from the rapid growth of tourism, was also raised as an area for concern, particularly the lack of attention that has been accorded to environmental management in considering the costs and benefits of tourism developments. Ivor Jackson, in his paper reproduced in this publication, observes that,

> "Caribbean tourism has grown appreciably since the 1970s. This is mainly due to deliberate policies instituted by regional governments to expand the hotel plant, to accommodate tourists vacationing in the region, and to encourage cruiseships to call at Caribbean ports. These

policies had an overriding socio-economic goal to provide jobs, foreign exchange and government revenues. These aims have been met to a large degree, but at heavy environmental costs.

"By and large tourism developmental strategies have been rigorously pursued without expending equivalent energy on managing the natural resources upon which tourism depends—landscapes for scenic pleasure and inspiration, whether journeying by land or sea; beaches for leisure and recreation; coral reefs for diving and snorkelling; offshore cays for a variety of pleasures; geo-physical and other natural wonders that tourists find attractive. This approach not only degrades resources that are valuable to tourism, but that are valuable to other industries as well—notably, fisheries."

The current prognosis for change is not encouraging. It was noted that the number of international visitors to the region grew from 4.24 million in 1970 to 9.65 million in 1987. Further, just to serve the increasing number of cruiseship passengers wishing to stayover in Caribbean resorts, it is anticipated that a 25 per cent increase in rooms will be required in the period 1987 to 1991. In spite of these growth trends, there is no evidence to suggest that plans to install or upgrade sewage waste infrastructure will match the need for new resorts and urban support services.

Numerous recommendations relevant to the tourism sector were made. It was suggested that emerging popular tourism activities, such as scuba diving, yachting and cruise shipping all warrant assessment of impacts, costs and benefits, particularly with respect to the resources upon which they are sustained. In addition, priority was given to assessing the real contribution of tourism to economic development, including costs imposed on the natural resource base, as well as socio-cultural and supporting community costs and benefits. Many agreed that, in addition to the environmental costs imposed by tourism, there were substantial socio-cultural costs borne in large part by local communities serving the tourist industry that must be considered in impact assessments and tourism development planning.

The issue of who pays for environmental and resources management introduced a number of other proposals. Many felt that the tourism industry does not contribute to environmental maintenance and waste management costs in proportion to its reliance for income on the natural resources base. As such, the industry should be more proactive in seeking ways to increase its contribution to effective environmental and resources management,

protection and enhancement. Suggestions included devising cost-sharing arrangements with governments for environmental management, charging a consistent and realistic user fee to all cruiseship passengers, soliciting international financial and technical assistance, and seeking ways to increase and retain in the region the net expenditure per tourist.

Governments also were criticized for their insufficient commitment to managing, protecting or enhancing the crucial resources that bring in foreign exchange earnings through tourism. Many have not explored possibilities for using tourism as a potential contributor to the public purse for these purposes. Processes to evaluate costs of sedimentation on reefs, waste disposal and social impacts were judged to be critical for assessing the relative merits of cruise shipping. Just as host countries charge for freshwater, they should also charge cruiseships for waste disposal services. It was clear to many that the traditional measures of a successful tourism strategy, such as hotel stayover and cruiseship passenger arrivals are insufficient for judging the overall costs and benefits of this sector to economic development. As Jackson observes,

> "Governments must be prepared to shoulder a greater proportion of the costs of resource management. Dependence on external agencies to cover major portions of the technical and financial costs for the management of natural resources cannot go on indefinitely. Funds must be raised domestically to cover these costs by instituting tax measures, non-governmental mechanisms and a shifting in national expenditure priorities."

The point was also made that some types of tourism development may be better situated inland, rather than in coastal zones, since many countries have more to offer than sun, sea and sand, which are never that far away. However, this does not imply that inappropriate unsustainable activities/actions of the past should be transferred or applied to new/different resources or zones.

The urgent need to address problems resulting from excessive use of the marine and coastal areas as ultimate disposal sites for waste, was also highlighted from a tourism perspective. It was generally agreed that the maintenance of the quality of coastal waters for health, recreational and aesthetic reasons was as critical for the tourist industry as for the productivity of coastal ecosystems and commercial fishing. This led to recommendations for improving site selection and management of waste disposal sites, streamlining institutional arrangements for waste management, and exploring potential incentives to encourage those who do not have access to waste disposal systems and sites to adopt practices that do not

degrade the productive capacity of the resource base. Other recommendations included the need for user fees to cover at least the costs of operating waste management infrastructures, coupled with regional co-operation to ensure that paying for waste management cannot be avoided in the region. These fees should be such as to promote waste reduction and re-use or recycling.

Assessing the carrying capacity of the natural resource base to assist in determining which uses and what kinds of development, can be undertaken and managed on a sustainable basis, was also a constant theme of the discussions. Many agreed that the lack of information to estimate carrying capacity has led to land use planning, zoning and developmental strategies that do not and cannot support sustainable development in marine and coastal zones. As Clement Lewsey noted,

> "Having regard to the spatial limitations of small island nations and the interrelated nature of coastal and marine ecosystems in these islands, it is not sufficient for plans to only accommodate growth demands, but in the process they must evaluate the ability of the environment to accommodate proposed growth. . . . Inventories must be undertaken to identify and classify coastal lands and resources. Once this data base is established, coastal lands can then be classified by use category. These categories can be used to establish major development sub-zones based on the limitations of their physical and environmental characteristics. . . . While the economies of most CARICOM nations are heavily dependent on their coastal environments and rely extensively on this zone to sustain economic growth and development, the national physical developmental plans of these countries do not reflect this phenomenon. These plans are usually traditional in scope and do not target the coastal area as a specialized sector for alternative development considerations. Furthermore, these plans lack functional elements to deal specifically with the coastal area."

Adding to Leonard Nurse's arguments pertaining to the maintainance of natural coastal processes, Lewsey outlined the rationale for improved land-use planning and zoning for multiple and specific uses.

> ". . . three coastal zones (off-shore or marine, beach and coastal lands extending inland from the landward extremity of the beach for a designated distance) are ecologically connected because of the fluctuation that takes place within these boundaries. As a result, activities that

> occur in adjacent coastal lands can have a direct and immediate impact on the offshore zone. It is important to note that most CARICOM countries are uniquely affected by this phenomenon because of the close geographic proximity between the offshore zone and the adjacent coastal lands. When man-made developmental activity is added to the ecological complexity of these three zones, the need for effective coastal management becomes increasingly apparent."

It was generally agreed the current multi-jurisdictional nature of coastal management and development activities, with overlapping responsibilities and "turf" conflicts, has precluded progress toward a holistic coastal zone management concept. It was felt by many that these institutional constraints are so deep that only action at the highest levels of government to formally introduce coastal zone management into the planning and development process will overcome the reactive, fragmented approach currently practiced in many countries.

Specific recommendations with respect to land-use planning and zoning in the coastal area included the need: to revise land-use policies; to rationalize and exercise more effective control of physical development through the use of environmental impact assessment in the development process; enforce minimum building setbacks; maintain access to the coastal zone for residents; and assess the value of maintaining some areas/zones in their natural state.

The potential for reinforcing land-use controls through such means as the transfer of development rights to other zones, and the judicious use of incentives and tax measures, were also highlighted.

> "Although land-use controls can be effective in regulating and influencing development in coastal sub-zones, when these devices are used in conjunction with tax incentives they can more effectively control the use of coastal land. A tax classification system can be established based on the type of coastal-use activity and the degree of environmental impacts associated with this activity. . . . Taxes can be levied based on the type of coastal use and on the level of technology utilized to control pollution elements." (Lewsey)

In discussions of the fishing industry, it was stressed that the 300,000 fishermen, who depend on this sector as their principal means of livelihood, have little control over trends that are adversely affecting the quality of the marine environment. Rather, these trends are largely the result of coastal development activities that have

brought problems of pollution, including the destruction of critical fish habitats and life supporting systems, as well as policy instruments and regulations that have prompted over/under exploitation of species. Possible climate change and sea-level rise will further affect fisheries production.

Bisessar Chakalall stated, in the introduction to his extensive review of the fisheries sector, that,

> "Even though information on the current state of exploitation is inadequate, the commercial nearshore demersal species (conch, lobsters, etc.) are fully exploited or even overfished in most countries. The deep water demersal species (snapper, grouper) are probably under-exploited, although there are reports of local depletion. . . . Regional co-operation is critical for a variety of reasons, including stocks under the jurisdiction of more than one country at different times of their life cycle and the existing disparity in expertise, experience, technical and financial resources. It should be based on the characteristics and nature of the resource, rather than on economic and/or political groupings. . . . Even though a number of marine parks and protected areas have been proclaimed in the region, most of them are not properly managed and are regarded as "paper parks." Critical marine habitats must be effectively managed for sustained fisheries production. All sectors of the economy, especially tourism (recreational fishing) would benefit. Other economic sectors (tourism, marine transport) usually compete for the use of these critical habitats for ports, anchorages, dive sites, marinas, etc. Developmental planning allows for choices and trade-offs to be made."

It was acknowledged that most countries have identified broad goals and strategies for the sector, but the lack of both a regional focus and detailed developmental plans that allow for choices and trade-offs between policies and regulations, so as to achieve stated goals, is cause for concern. As Chakalall explained,

> "Subsidies on fuel, equipment, gear, or sale of fingerlings and feed at less than production costs are the most common in the region. They are usually introduced for social reasons in order to keep the consumer price low or as an economic incentive to induce development in relation to new fisheries or adoption of new technologies. . . . However, in fisheries, there are a number of problems with subsidies, in that inputs can be easily transferred to

already over-exploited or non-target species. As a result, subsidies are ineffective when the resources are on the point of becoming over exploited. Due to the socio-economic conditions of the coastal fishing communities in the region, it is very difficult to stop subsidies once they are implemented. Continuing the subsidies usually distorts the economic reality and disrupts the commercial channels of input supply and credit in the long term.

"[With respect to regulations, they] are only likely to be effective if they are adequately enforced. Unfortunately, the fisheries administration in most countries and especially in the small island states lack the required human and material resources for an effective surveillance and enforcement program. . . . In most cases there is reluctance to enforce regulations for which there is local empathy. One of the main reasons for the countries not enforcing the regulations is because fisheries management comprises socio-economic, political, as well as biological issues. Authorities avoid taking decisions in view of the unpopular nature of regulatory measures motivated by the precarious economic and social situation of small-scale fishermen in most of the countries."

It was acknowledged that most governments are unable to offer the types of incentives that will attract the range of specialists required to undertake the problem-oriented research necessary to address these types of integrated fisheries planning issues. It was further acknowledged that few governments require such specialists on a full-time basis. This led to the suggestion that universities adopt policies that would enable their pool of expertise to provide technical assistance to countries throughout the region on a systematic basis. Chakalall also suggested that,

"Attempts should be made to introduce and encourage community-based management on an experimental basis to the wider Caribbean, even though there is no record of "formal tradition" in the region. However, there are examples of fishermen acknowledging traditional fishing rights to marine space and observing unwritten rules and regulations concerning conservation. [Community-based management] has the potential of reducing administrative costs to government by using local knowledge and expertise, responding to the needs of the community and being acceptable to the resource users. Local commitment is essential for conservation. It has the potential to

> cultivate self-confidence and self-regulation at the local level and also to reduce the decline of coastal fisheries. It can be viewed as the median between centralized and decentralized fisheries management. These potentials are highly desireable to the Lesser Antilles, due to the scarcity of human and financial resources."

Other actions suggested to support improved management of the fisheries resource base on a regional basis included direct public involvement and assistance in such areas as the promotion of small-scale fisheries and co-operatives for processing and marketing, ice plants, processing plants, wharfs, marketing facilities and the like. A comprehensive review of incentives and regulations, including their enforcement, from a sustainable perspective was also highlighted for priority attention. This assessment should include such areas as price controls, import quotas, export embargoes, quality standards and grades; fisheries management regulations including licensing schemes, access tax, collective quotas, individual quotas, mesh size and gear criteria, closed-season parameters; and a range of other direct and indirect fiscal and tax incentives.

A feature of this panel discussion was the stress placed on the potential of using new and under-utilized resources to contribute to socio-economic goals and objectives. References were made to under-utilized fish species to generate income for fishermen, alternative construction materials to replace sand, and moving the emphasis on certain marine and coastal tourism resources to other areas, such as inland resources including parks and protected areas, to generate income and support cultural or scientific pursuits.

Due to the nature of the marine and coastal resources of the region, as well as the key sectors that depend on maintaining their integrity for income generation, a number of recommendations were made for co-operation and action at the regional level. First, a regionally consistent and proactive approach is required to ensure developmental activities, particularly in the areas of tourism and fisheries, do not lead to excessive competition and depletion of vital resources for the sake of short-term economic return. For instance, consistent rates for the use of resources, infrastructure and products, at specified standards, should be charged. This applies to waste disposal by cruiseships, hotels and industries; general pollution control; and fisheries exploitation, particularly for migratory species. The need to strengthen regional institutions concerned either directly or indirectly with various aspects of marine and coastal resources management was also stressed, as was the need for ensuring that environmental and natural resource considerations are promoted in tourism marketing. In this context, a program to inform tourists about the regional ecology, along with suggestions as to how they

might help protect, maintain and enhance these resources, including the communities that are dependent on them, was recommended.

A second overriding concern was related to information dissemination. It was noted that, although a large number of useful studies have been undertaken in the region and reports have been prepared, by and large these have not been made available for general distribution. This practice needs to be reversed. In addition, more appropriate data on marine and coastal resources is required to identify available options to support informed decision-making regarding resource development and management. For instance, monitoring programs in such areas as water quality, waste disposal, the impact and economic value of yachting and scuba diving activities and fish catch must be maintained and enhanced to provide useful input to policy and decision-making. The point was made that most politicians are just not aware of the environmental and natural resource implications relevant to developmental priorities and decision-making. Similarly, understanding and awareness of the general population, as well as direct and indirect users, should be enhanced so as to promote behaviour that is supportive of the environment and of the natural resource base. In this context, public education that would focus on issues such as littering and endangered or threatened species and habitats was also recommended for regional action.

Finally, as mentioned earlier, stayover and cruise passenger arrival figures are not necessarily accurate indicators of the economic impact of the tourism industry. Similar measures in other sectors may also be deceiving, particularly since they do not incorporate information on the utilization, depletion or status of the supporting resource base. As a result, it was recommended that information gathered to measure performance of industries, sectors and the economy should incorporate environmental resource and social considerations so as to provide a longer-term perspective of economic and ecological sustainability.

Productivity Improvement and Waste Management

The focus for this panel was "What shifts in science, technology, infrastructure and management policies and practices are required to reduce the natural resources and energy content of growth and, at the same time, increase productivity and protect, preserve and enhance the natural resource base?" The presentations and ensuing discussions concentrated on the following key issues: the role of the private sector in promoting sustainable development; modifications to the production process; the role of science and technology; scientific and technological policy; the role of knowledge and information; the

importance of human resources; the need for regulation and fiscal and economic incentives to influence the private sector and other activities; waste management and minimum standards for operations; collaboration among various interest groups to undertake research and development; and decision-making processes that ensure equitable distribution of the costs and benefits of development.

It was generally acknowledged that, in the last two decades, there have been several changes to production processes, largely resulting from technological innovations, that have reduced both pressures on natural resources and the generation of waste from agriculture, energy and industry. These reductions have occurred through declines in the raw material inputs into manufacturing products and processes paralleled by increases in the knowledge content of growth. Nevertheless, it was acknowledged there is a need to reduce further the production of wastes and to minimize the natural resources content of growth through attitudinal and social change, introducing supportive market mechanisms, and furthering technological innovation.

Another underlying theme of the discussions was the need for the region to become far more selective in the developmental policies and projects it pursues. There was strong agreement that a region predominated by small islands, with a limited range of exploitable resources, limited manpower and limited economic means, needed to carefully identify appropriate growth opportunities, and the mix of changes required to propel them. No longer can the region be led by the requirements of donor-supported projects and programs in determining its sectoral planning, financing and production norms and processes.

With respect to effecting a reduction in the creation of wastes and in other negative externalities to the production process, there are individual, private-sector, and public-sector dimensions. These were summarized succinctly by Keith Panton:

> "It must be recognized that, to some extent, we are all polluters. As inhabitants of planet earth, we all have a vested interest in preserving the integrity of the environment for present and future generations. In light of this, attempts to apportion blame without concurrently identifying practical ameliorative measures are not constructive. It would be infinitely more useful to examine areas in which government, industry, the public and the media can collaborate in initiating corrective action to address a common problem."

More broadly, there is the dimension of "collective" responsibilities, such as who should pay to protect and to effectively

manage the environment. Here, Panton summarized the conclusions of a 1988 public-opinion survey commissioned by the United Nations Environment Programme in 14 countries, representing diverse social and economic perspectives,

> ". . . large majorities in each country surveyed expressed willingness to make personal sacrifices, including higher taxes and reduced living standards, if those sacrifices resulted in benefits to the environment and reduced health risks. These attitudes signal clearly to industry that the public understands that some of the financial costs of sustainable development will be passed on to them and that they are willing to bear these costs."

To reinforce the shared responsibility for considering and paying for the environmental and resource implications of development, Naresh Singh, in his presentation on waste management, pointed out that resource utilization, economic activity, waste management and environmental protection are highly interrelated:

> "The major economic sectors or activities in the Caribbean region are agriculture, tourism, industry, forestry and fisheries, supported by the public service and private commercial sectors. All economic activity consumes materials and energy through some process that yields a desired product or service and generates, at the same time, some by-products and/or wastes, either as matter or energy or both.
>
> "The environment has ultimately to act as the receptacle for the wastes generated by economic activity. Experience and information to date . . . suggest that this environmental pollution capacity, though variable, is finite. . . . Traditionally, it has been assumed that air, water and soil are in the public domain and that these media of the environment can absorb limitlessly and free of charge the unwanted residuals of economic activity. It is now being realized that these are "open access" resources of great and increasing value, which present society with important and difficult allocation problems that exchange in private markets cannot solve. More recently, environmental economists have been utilizing various methods of assessing the economic value and/or opportunity costs of utilizing the waste-disposal option of the environment."

Two main categories of measures were identified through which governments can promote improved waste management practices. First, there are regulatory measures such as bans, emission controls, input controls, consumption controls, price controls, rate-of-return regulation, standards including emission standards, licensing and certification. Secondly, there are tax incentives, tradable emissions and other tools to alter market signals. It was agreed that each has a role to play, and it is likely that an appropriate mix of both techniques could be designed to suit the social, cultural and political context of each country in the region. Some argued that market mechanisms should be stressed, if resources are lacking, to enforce regulatory mechanisms. Nevertheless, the same issue was raised with respect to monitoring compliance and distributing credits based on performance. Singh summarized common approaches and practices this way,

> "Fiscal incentives include emission fees (or effluent charges), tradable emission rights (or transferable discharge permits), deposit-refundable systems, taxes (excise taxes, taxes on firms, personal income tax, property taxes, tariffs), subsidies and direct government expenditures (such as R&D support and direct purchases). The three major fiscal instruments designed primarily to internalize environmental externalities are emission charges, tradable emission rights and deposit-refund systems."

> "Currently, most governments use command and control policies such as emission standards while, on the other hand, the economists point out that only market-based incentive approaches have the potential to reduce control costs substantially by providing the incentive for the polluter to choose the technology that will reduce emissions in the least costly way. Further, in the market incentives approach, entrepreneurs have an incentive to devise technology that brings down pollution even below the regulation minimum. Command and control often means government telling polluters what technology they must use to clean up, and the government may not know what is best."

While most acknowledged the validity of these government measures, the general consensus was that effective waste management will likely result from targeted information programs designed to increase awareness, and through technological innovation supported by model projects. Examples of such projects included the

source separation of wastes and composting of biodegradable materials produced by households,

It was argued that the most pressing waste-management problems prevailing in the region are solid and liquid wastes, particularly sewage and hazardous wastes. Various strategies for minimizing the production of wastes were recommended, including developing and implementing guidelines on appropriate levels of treatment, methods of disposal and characteristics of facilities suited to specific waste types. Waste management priorities for the region were prioritized by Singh: avoid waste generation; reduce or minimize waste generation; re-use or recycle waste—preferably on site; treat and dispose of waste on site; treat waste on site and transport it for disposal; treat and dispose of waste after transport to a designated site.

There was also strong agreement on the need for governments of the region to harmonize standards and practices for waste management, environmental impact assessment and other standards of environmental quality in order to prevent the growth of pollution havens in the region and to prevent investors from playing one country off against another.

With regard to company practices and business policy, it was felt that the private sector must adopt a more proactive approach and less defensive outlook on environment and sustainable development. It must join the move away from end-of-the-pipe technology to waste reduction. In addition, private-sector enterprises should help universities and other human resource developmental institutions in promoting research and development aimed at strengthening the technological base of waste reduction methods and at developing engineering curricula that emphasize environmental and public-health protection as integral factors of industrial plant design and operation. A proactive strategy would have industries establish effective community participation and involvement programs. As Keith Panton pointed out,

> "The pro-active mode of pollution abatement accepts as its central premise that environmental management is an integral part of a business enterprise. . . . Enlightened companies that subscribe to this approach, often regard government regulations as minimum standards and establish their own in-house targets, which are usually more stringent. Environmental audits of their operations are now a way of life and, from these audits, action plans for ameliorative action are established with both timeframes for achievement and the person responsible clearly specified.

> "With some exceptions pollution abatement has tended to be largely reactive in nature. Technology changes for the most part tend to be implemented in response to regulatory action. . . . The bottom line, however, is that the remedies tend to be expedient rather than long-term, and an increase in public cynicism and criticism usually results. . . . More importantly, however, re-active pollution abatement treats the symptoms rather than eliminates the cause of the problem."

Panton added that companies should publicly declare their commitment to safe, environmentally sound operations, and support this through "eloquence of action." All major capital projects should be subject to an environmental impact assessment as a pre-requisite. In addition, he proposed that international and domestic public sector institutions, that provide capital for the private sector, should insist on the preparation of adequate assessments, as a precondition to the release of such capital.

Panton also stressed the need for industry to focus more attention on waste reduction and information sharing.

> "The technological framework, on which the "end-of-pipe" variety of destruction and separation techniques are built, is generally accepted and well-developed. However, the technology of waste reduction, as an alternative to treatment and disposal, does not have a widely accepted scientific basis. . . . Hopefully, industry will opt to voluntarily share information and initiate projects with research scientists who can assist in development of appropriate technology, [since waste reduction technology may be quite process specific.]"

Some debate focused on the transition to a service and information economy, with business taking a leading role. While the many benefits of increasing the information and knowledge content of growth were acknowledged, it was felt that it is necessary to ensure a balanced and diversified economy. The role for information and knowledge was seen primarily as enhancing productive activities, rather than as an alternative to them.

To support reduced resource and energy use in growth, increased emphasis on innovation, imagination, new ways of finding and using information, new research and development, and investments in skills and knowledge were highlighted. The increased use of information and knowledge in the economy is a global trend and should be applied in order to improve the productivity and competitivity of existing industries (i.e., bauxite, tourism, petroleum).

As well, indigenous research and development programs and activities must be strengthened, with better linkages to production.

In addition to minimizing and managing wastes, a mix of command/control and market-based incentives is needed to promote the development of science and technology that is relevant to the Caribbean, and to undertake strategic analysis for development that is augmented by information and knowledge. Strategic planning and analysis must recognize natural resource limits, as well as the limited scope for research and development and science and technology, and make a systematic assessment of available information and international economic trends. To design more focused programs, scientists and technologists must be brought in at the beginning of the development planning process, and look at long-term prospects instead of only immediate concerns. Desmond Ali, whose paper is reprinted at the end of Part II, pointed out,

> "The major objective of any scientific and technological policy must be to use scientific technological techniques to satisfy the basic needs of our people for food, shelter, clothing, health, education and leisure. In fact, not only must science and technology be used to satisfy these needs, but to improve the standard of living of all our people in every sector of society. As well, such improvements must not come about at the expense of our sovereignty, our environment or our cultural heritage. To meet this objective, scientific and technological policy must adopt a three-pronged approach. It must emphasize human resource development at every level, the importation of technology and the stimulation of indigenous R&D.
>
> "In the Caribbean sub-region, the impact of external influences and, in particular, technology has been a crucial element in our socio-economic evolution. To a large extent, we have been bystanders to the process. As a result, the basis for sustainable development has not taken root. If this is to happen—and it must to ensure the survival of our fragile and susceptible environment—we must become more and more involved."

It was acknowledged that technology "makes resources" and this of itself demands a more proactive approach to defining the role of science and technology in development to ensure regional needs and aspirations are met. In this context, it was agreed by many that increased attention must be given to assessing the relevance of imported science and technology, especially that which is donor-sponsored. Similarly, indigenous research, development, design

and models must be more rigorously assessed. Similarly, state intervention, to facilitate the role of science and technology in development, has not only been insufficient, but has ignored the fact that economic growth depends on technological innovation and institutional development. In this context, it was stressed that science and technology policy instruments are both explicit and implicit. For example, many developmental policies, whether they relate to food aid or exchange rates, or whatever, can have a profound impact on the focus and funding of science and technology. As such, these impacts must be fully assessed and considered in the policy developmental process.

Utilizing the ingenuity of individuals and non-governmental groups to improve productivity was another area targeted for increased attention. It was acknowledged that employees, the community and other interested groups can provide vital inputs to the production process. To promote and respond to this enlightened public involvement, it was suggested that industry consider appropriate incentives. As Panton stated,

> ". . . corporate leaders have an obligation to tap the creative talents of their employees, who are, in fact, their most important resource. Incentives and rewards should be provided to employees to encourage creative suggestions for pollution abatement. . . . It is one of the hallmarks of good corporate citizenship for companies to promote judicious public participation in their activities by community leaders and the public at large. The public participation spectrum ranges from simple press releases to full-blown commissions of enquiry. The goal should be to promote participation in the middle of the spectrum, which is characterized by honest information exchange, sensitivity in listening to community concerns and expeditious addressing of the concerns. . . . We need as a matter of urgency to educate the media by inviting them to visit our plants and providing them with the facts."

Inadequate attention to human resources development and the exodus of skilled professionals and technicians from the region in the past were identified as both causes and symptoms of current developmental patterns. To address these issues, many agreed that more attention must be accorded to attracting and maintaining suitably trained personnel, introducing management reward systems, and to training which includes motivational skills. In addition, promoting the development of indigenous technologies can provide an incentive to managers, scientists and technologists to stay in the region.

Among the suggestions for improving education as it relates to productivity improvement and waste management, emphasis was given to the need for enhancing information skills and, in the training for engineers, chemists and others in environmentally risky professions, ensuring that pollution control becomes an integral part of plant design and operation instead of an afterthought. As mentioned earlier, waste management practices at the household level can be improved through the use of model projects that are designed to increase both understanding and awareness.

With respect to regional and international concerns, the point was frequently made and broadly endorsed that Caribbean governments must clarify policies regarding the importation of technology, and enhance their negotiating abilities as well. The capacity and will to reject inappropriate policies and projects offered by donor agencies and to press for greater understanding of national and regional aspirations and needs by these agencies must not be underestimated. It was also stressed that international standards must be adopted by all countries so that environmental protection cannot be an avoidable cost. The need for regional co-operation to harmonize foreign policy, not only in the area of waste and pollution, but also with respect to science and technology, investment and co-operation with international assistance and financial institutions, was also reinforced.

Human Resources Development

For the panel session on human resources development, the presentations and discussions focused on the question, "What education, employment and public awareness/participation policies and practices, including gender considerations, are required to enhance natural resources management measures and to facilitate adjustments for more sustainable forms of development?" Suggestions that emerged focused on: promoting multi-group interest and participation in decision-making; increasing the awareness and understanding of sustainable development issues from both the human resources perspective and the environment and natural resources perspective; and increasing regional efforts to educate resource managers, providing them and other disciplines with the necessary skills to understand the environmental and natural resource implications of socio-economic development and management. Most of these suggestions are relevant to national and regional decision-making processes and consensus-building on related matters such as labour-management relations, community development, policies at the macro level, debt and the alleviation of poverty.

Overriding concerns expressed during the discussions included the alleviation of poverty and relative deprivation, in both the immediate and strategic senses. Improving the harsh conditions of life for the majority was also felt to be a social precondition for sustainable development. In addition to these issues, policy imperatives must focus on addressing inequality, which often aggravates tensions between classes and races and encourages sexism. The tendency toward individual solutions, North Americanization and internationalization—with positive and negative impacts—combined with the proceeding factors, are felt to be eroding the Caribbean peoples' sense of community.

A further pervasive theme was that many environmental problems and issues stem from the application of science and technologies that were developed to promote rapid growth and industrialization without giving consideration to the impacts they would have on all facets of society. Immediate action is required, therefore, to examine and restructure, as necessary, education, science and technology, and management policies and practices to ensure they respect and support social and cultural values and mitigate the environmentally damaging excesses of wealth and poverty. As well, governments, education establishments, non-governmental organizations and the private sector must act immediately to guard against, and even reject, adopting or accepting support for approaches to development that are incompatible with broad societal needs.

Throughout the Conference, it was stressed repeatedly that to effectively address the concept of sustainable development, a comprehensive and innovative reassessment of education and training curricula, practices and institutional arrangements at all levels is required. LaVerne Ragster, in presenting a paper co-authored with Peter Bacon on the tertiary level of education and training in resources management, outlined a model designed to produce managers who can effectively link the complexities of natural resource systems with those of human systems. For the Caribbean region this assumed eight natural resource management areas—coastal zones, soil, land, mineral, tourism, forestry, water, and wildlife—for each of which,

> ". . . if development is to be sustainable, it is essential to: have accurate resource inventory and status assessment assess national resource requirements; understand the reasons for sub-optimal resource utilization; clearly define national policy for natural resources management; have an appropriate natural resources management network; have an aware and supportive private sector and general public."

This led Ragster and Bacon to suggest that tertiary education be focused on the following five resource management skills, methods and procedures:

- "*Data Collection and Storage*. Research, (geography, geology, biology, economics, sociology); surveying, inventory/data-base compilation; data atlas production; remote sensing interpretation; and cartography.
- *Resource Assessment*. Ecosystem and habitat evaluation; stock assessment; yield assessment; alternative-use assessment (options); benefit-cost analysis; resource-use modelling.
- *Management Planning and Land-Use Control*. Policy planning; system planning; economic planning/budgeting; park planning; zoning; site/construction planning; legal drafting; environmental impact assessment; risk assessment.
- *Management Practice*. Regulation and enforcement; wardening; visitor handling; business management; staff/personnel management.
- *Public Education*. Publicity and promotion; public awareness campaigning; public participation organization; community project management; training course coordination; educational materials production; demonstration project organization."

In addition, it was stressed that training must provide the skills necessary to function competently within inter-disciplinary teams and to understand management from a multi-dimensional perspective. Reflecting on the present situation, Ragster and Bacon observed,

> ". . . tertiary institutions in the region are not providing, and are probably not capable of providing, the necessary special facilities and expertise for a quality program in resource management that can meet the personnel needs of the region in this area. This situation is likely to persist if mechanisms that reduce the barriers between institutions and enable the efficient use of human and material resources in the region are not explored, initiated and supported."

Nevertheless, it was acknowledged that CERMES and various other agencies are playing an invaluable role in presenting workshops and short courses to upgrade the skills of various specialists, such as biologists, agriculturalists and the like, who are being called upon to function as resource managers. However, these

short-term training exercises do not add new professionals to the pool of resource managers, and it was with this in mind, that a consortium educational program has been established in the region.

> "The Consortium of Caribbean Universities for Natural Resource Management is a grouping of fifteen universities and three collaborating institutions dedicated to co-operating for improved resource management education in the Caribbean region. . . . The Consortium seeks to: improve information flows among members on course offerings, facilities, student needs and documentation; share faculty, students and references when necessary; encourage co-operative undertakings such as special courses or curriculum development workshops; and recommend standards and procedures for inter-institutional accreditation among members.
>
> "The organization and development of the Consortium provides the opportunity for tertiary institutions of the region to work innovatively as a group and individually through co-operation as they produce appropriately trained resource managers for the Caribbean. The Consortium . . . should lead to universities functioning satisfactorily with each other and donor agencies on a regional level; the more efficient use of institutional, human and material resources; the reduction of language and accreditation boundaries; and an increase in appropriate methodologies for the region. Most importantly, this association has the potential to produce graduates that are able to effectively address the multi-disciplinary nature of resource management in the context of an island's natural and human systems. The philosophy for training is management and experience oriented, with emphasis being placed on the Diploma and Master's levels."

Several suggestions were made for the future focus of the Consortium. First, was the need to establish a regional education program that could provide advanced, specialized courses at different institutions, and that could be accessed by students from anywhere within the region. Second, was the need to develop inter-institutional accreditation mechanisms between tertiary institutions for resource management programs. Third, was to provide opportunities and support for updating faculty expertise and faculty interchange opportunities. Fourth, was the need to promote the enhancement of language skills and computer literacy in faculty members. Finally, it

was suggested that the Consortium support faculty and experts in the region in developing educational and training materials in natural resource management appropriate to the region.

Beyond the tertiary level, there was full agreement that environmental concepts should be integrated into education to increase awareness and understanding at all levels and for all groups, both within and outside of the formal educational system. It was particularly emphasised that more attention should be given to teaching and sharing strategies for preventive action, as well as for project organization, management and leadership at the community level. This would catalyze political activism, arouse voters and contribute to behavioural change. Some considered the Conference itself was a means for contributing to this objective at the senior level.

Not only is it necessary to raise the level of public consciousness if environmental and natural resource problems and issues are to be addressed, but also regarding how to introduce and support necessary change. Quoting from a network of Philippine NGOs, Peggy Antrobus, whose paper is reproduced at the end of Part II, pointed out that the intensifying environmental crisis has brought about,

> ". . . a heightened awareness among the mass of people that somehow or other the roots of their problems are embedded in the very structure of the social and economic system and are inherent in a strategy of development that preserves and protects this inequitable structure . . . [and that] . . . there is a widespread belief that there are alternative development models which directly address their poverty and provide growth and development consistent with an equitable sharing of the burdens and fruits of progress."

Many participants stressed that macroeconomic policies which promote the extremes of affluence and poverty do not contribute to the achievement of sustainable development. It was noted that, since these policies do not recognize the needs and concerns of the poor, they do not even catalyze the public to take into account environmental and natural resource considerations in their daily activities. This led Antrobus to stress that space must be allocated on the agenda for the,

> ". . . perspectives of the people whose lives are most affected by the negative consequences of the unsustainable development practices that Caribbean governments and peoples have pursued in efforts to develop our countries. . ."

With regard to the public's participation in decision-making that affects their lives, it was recommended that governments and industry welcome and encourage communities and non-governmental organizations to contribute to the design and implementation of developmental initiatives that are fair to both society and the environment. Processes of empowerment must be introduced that have sufficient supporting resources invested if social change and transformation are to occur. It was suggested that without the opportunity to truly participate and influence the developmental process, there is an increased alienation that feeds demotivation.

The need for mass communicators to become actively involved in planning and decision making processes was highlighted. They should facilitate the articulation of priorities for all societal groups. Unless they perform these proactive roles, their involvement becomes little more than a public relations exercise. It will be necessary for them to help define and communicate a concept of development that individuals can be responsible for and for which they will have to do certain things in terms of their lifestyles. In this context, it is important to identify and target specific audiences so as to fully tap their bodies of knowledge, experiences, values, culture, communication patterns, ways of relating, strategic survival interests, authority structures, community organization modes and alliances—all of which can be used to advantage if the message and concerns being promoted are legitimate.

It was also suggested that environmental impact can be influenced by looking at patterns of consumption and the role of consumers, and women as agents of change. Some felt the role for the media should be to reinforce and complement other forms of communication. As well, the need to reach people "where they are" was stressed because participatory and "action" research are both necessary and important at the local level in everyday activities.

Discussion also focused on the differing viewpoints that are prevalent among the groups and constituencies in the debate on sustainable development. These are discussed in some detail in the Antrobus paper, but can be summarized as mainstream environmentalists who are concerned with ensuring simultaneous and forceful growth that is socially and environmentally sustainable; professional environmentalists who are technical experts on environmental impact and systems for monitoring the effects of development on the environment; population control groups concerned about the negative impact of over population on a limited resource base on the quality of life; "deep" ecologists who share a philosophy that embraces the primacy of the natural world; tribal peoples who are concerned about the threats to a livelihood based on a symbiotic relationship with the land and the preservation of land rights; local

communities whose health is affected by industrial waste, or whose quality of life is threatened by certain types of development; and the financial interests underlying the global economic system.

In the presentations and discussions, it was clear that the influence of the international economic interests of industrialized countries have not been generally supportive of sustainable development in the region. Trevor Munroe, whose paper is appended at the end of Part II, asserts that the approaches thus far adopted for debt rescheduling are clearly an example of,

> ". . . sacrificing future generations on the altar of immediate expediency. It would be more relevant to put together an effective coalition—at the national, regional, and international levels—around meaningful debt forgiveness, flexible wage guidelines linked to productivity, comparability and profitability criteria, differential interest rate regimes geared to expand net export earnings, and a fiscal policy aimed at encouraging re-investment of surpluses in order to increase production and employment. Dialogue and, ultimately, campaigns around alternative approaches are certainly implications of sustainable development."

Because of the enormous social and potential, environmental and natural resource impacts of debt and debt repayment, there was considerable support for Munroe's proposal that the Caribbean labour movement, alongside workers' movements throughout the Third World, should become active participants in lobbying for fundamental change to current IMF models and programs in order to facilitate rather than constrain sustainable development.

It was also argued that, since the economies of the Caribbean are increasingly led by the private sector, centers of private decision-making power have a major responsibility to catalyze and assist workers to develop a material and moral interest in sustainable development. Particular emphasis was given to assisting the labour movement to focus on building public awareness and education, and to targeting strategic groups through non-traditional methods. This emphasis was needed because trends point to declining real per capita expenditure on all types of education, and marginalization of the state in economic decision-making. This implies that the community of non-governmental organizations, particularly those representing labour and capital, will have to play a major role if anything meaningful is to be achieved. It was also stressed that action on this front could help labour reverse the trend of an increasing number of workers questioning the relevance and role of the trade union movement. Specifically, the sustainable development

concept challenges labour and management alike to adopt a problem-solving approach to issues. It also challenges labour unions to lobby and champion for the interests and survival concerns of women, unorganized labour and the disadvantaged.

There was also support for the notion that enlightened responses with respect to environmental issues at the plant and enterprise level would benefit from a full and effective power-sharing partnership between management and labour. This could, for instance, result in jointly devised incentive schemes that encourage workers to suggest ways of reducing energy, raw-material and environmental consumption per production unit. In addition, it was suggested that labour could join with management, as well as other representative groups in society, to more effectively lobby for appropriate governmental policy. Other issues addressed during the discussions regarding labour focused on the need for worker education as an approach to problem-solving and to ensure the development of a flexible and innovative workforce.

Just as the private sector should open its decision-making processes to wider interests, so should governments. Antrobus referred to the sustainable development debate:

> ". . . in order to ensure that the concerns of Caribbean electorates are heard, together with those of Northern constituencies, our governments must first explore these concerns with the people who are being affected. This means that our environmental movement must not only be fuelled from the top with sound technical information on such matters as potential climate change and inappropriate "mal-development," but must be fed from the community with the concerns of ordinary people for a safe and healthy environment.
>
> "In this regard, women—especially poor women—must be recognized as key actors since, in meeting the basic needs of people, theirs is the strongest relationship to food production and distribution, water and sanitation, and to health and education. Most important of all, as the chief agents of socialization, women are in a position to encourage those attitudes and practices that go toward building respect for our natural habitats.
>
> "Governments must therefore welcome and encourage NGO and community-based interest in and initiatives on environmental issues, and not see them as nuisances (or blocks to "their" developmental initiatives), as if the

purpose of development was to produce profits. In short, governments must resist what Clive Thomas refers to as the "tyranny of GNP" and align themselves firmly with the interests of the majority of their electorates if they are to achieve a model of development that is "fair to the present."

Postscript

There was agreement that more openness was required in decision-making processes at all levels, to encourage coalition-building among the numerous and varied interest groups. This was considered a key ingredient for building understanding and commitment around strategies to alleviate homelessness, debt, poverty and deprivation. Key issues to be addressed in this decision-making approach are daily survival, community cohesion, alternative economic and developmental approaches and the need for information and education to support these. Coalition-building at the micro level and at higher levels will be critical for moving from theory to assuring policies are endorsed and implemented, and to mobilize the necessary resources.

Throughout the Conference, the need to integrate environment and economics in decision-making, supported by multidisciplinary planning and management, was stressed. In particular, this panel focused on the need for the effective employment of trained personnel who understand the long-term, multidisciplinary implications of the concept. The role of resource managers, to lead broad-based technical teams, and to educate the public and actively involve communities in resource management was stressed. There was consensus that there should be increased emphasis on the multidisciplinary approach in all sectors and disciplines to complement this role of the resource manager, and that staff training in government, the private sector and other non-governmental institutions should incorporate multiple perspectives. This was considered basic to promoting a synergistic approach to deal with those issues that are difficult to address in isolation, and to overcome barriers posed by the persistence of theme-based approaches that are promulgated by a multitude of diverse interest groups with seemingly parochial interests. The need for more problem-solvers, who can use information from various sectors and interests effectively, was also highlighted.

Population growth rates were also identified as a critical, yet neglected issue in the sustainable development debate. The point was made that discussions on sustainable development usually focus on the visible aspects of environmental degradation and natural resources depletion, with emphasis on the potential for technology

and changes in consumption and lifestyle patterns to ameliorate these environmental issues. Yet policies that can slow the rate of population growth have the potential of buying time in the search for solutions to environmental and other problems, as well as of reducing the ill effects of inefficient social and other public policies. This led to the observation that, since population growth is not a problem in the North, it has been given only cursory consideration in multilateral and bilateral developmental assistance emanating from the North. Yet, interventions that would reduce population growth, adjust distribution and improve equality may be some of the best approaches for achieving sustainable development. It was also noted that such interventions do not require expensive capital investment and can often be accomplished through existing programs.

Water Resources Management for Sustainable Development

Thorant Hardware

I. INTRODUCTION

This paper examines the impact of development activities on water resources, and the implications of past and current public policies and practices in the light of regional aspirations for sustainable development. The focus is on small, tropical island ecosystems that are typical of many Caribbean countries. This paper analyzes future regional imperatives and policy options with respect to current trends in global population growth and natural resource use. The emerging trends of global climatic change as a major new dimension, having serious and urgent policy implications for a sustainable future for the region, are also examined.

The eighties decade has seen the economies of Third World countries increasingly constrained by the debt burden. The externally imposed structural adjustment programs have shifted national planning priorities away from the long-term goals of social and economic benefits and sustainable development. Instead, the pressures to restructure and service the growing national debts have forced governments toward short-term expedients involving the rapid and often unplanned exploitation of national assets.

The resulting pressures on the region's natural resources are likely to persist well into the foreseeable future. Land and water resources are major constraints to this politically attractive aspiration for instant development. This new, economic imperative puts a great deal of pressure on natural resources because of increased activities in agriculture, forestry, mining and quarrying, industry and tourism. Water resources will be a major casualty in the pursuit of rapid development at all costs.

In addition to severe economic pressures, the issue of Climatic Change has now become critical to the region's future. Global warming of the earth's atmosphere over the last hundred years has produced a 0.5 degree centigrade increase in temperature. Recent projections indicate that the most likely scenario for the Caribbean is a 1.5 degrees centigrade temperature increase, with an accompanying sea-level rise of around 20 cm. over the next forty years.

While the full effects of the changes in the hydrologic cycle are not yet fully understood, one anticipated impact is a significant increase in frequency and intensity of hydrologic events throughout the region.

This widely supported scenario forecasts an increase in floods, droughts and saline intrusion regionally, and hurricanes and storm surges that are likely to be nourished by higher surface temperatures in the oceans.

Professor Bhawan Singh of the University of Montreal recently concluded a study in which he focused on the anticipated changes of a variety of climatic variables, including global solar radiation, air temperature, humidity, wind speed, cloud cover, and precipitation, and how these changes could conceivably influence water resources in the Caribbean basin. He believes that the results of his study, while speculative, are very probable. He concludes that some areas of the western basin are likely to experience annual increases in precipitation, mainly in the dry season of the first half of the year. In the case of the eastern basin, a decrease is likely to occur during the dry season of the first half of the year.

This scenario will have a profound impact on natural resource-based economic production, especially agriculture, forestry and related industrial activities. The foreseen changes in human settlement patterns, water supply, sewerage, coastal-zone management and the recreational use of water will also require improved water resources management.

II. IMPACT OF PUBLIC POLICY ON WATER RESOURCES MANAGEMENT

Water management consists of all actions taken within a given society concerning the interface of that society with its water resources. These actions include adjustments in individual and social behaviour in response to natural and changing water resources conditions, and involve attempts to improve the relationship of man and water by enhancing the positive attributes of water and controlling the negative ones.

The definition of the individual components in a water management system is somewhat arbitrary, since such a system is

an interacting whole rather than a collection of discrete elements. There is, thus, a similarity in concept to the hydrologic cycle.

Public policy for water resources management in the region must be articulated in light of increased economic pressures on water resources and in the context of an environment rendered increasingly fragile by climatic change. This paper addresses these challenges to the region's future by clarifying some of the policy issues and by suggesting some rational prescriptions for water resources management over the next ten to twenty years.

National Water Policy

A water management system provides a framework for a wide variety of water-related decisions.

Policy establishes principles to guide these decisions in the attainment of national goals.

A basic function of policy is to establish objectives that set the goals of the water management program. The objectives must then be implemented to provide more specific guidance.

It is these objectives and principles that collectively define the role of water in socio-economic development and establish a basis for resolving the many conflicts that may occur in the decision-making process.

Water policy emanates from a variety of sources and exists in many forms. It may be embodied in laws and official documents and is created by the legislative body, executive officials and the courts. It may also be reflected in the administrative organization.

Ideally, water policy should follow a policy on general socio-economic development. Since it is but one component of overall national development, it should be integrated into national policy to ensure consistency and coordination.

National planners, in responding to the urgent and changing economic circumstances in the region, often overlook the importance of consistency in water policies that support national development. It is imperative, therefore, to review immediately present water policies and programs and to elaborate ones that are appropriate. The basic issues to be addressed include water management objectives and priorities, mechanisms for public awareness and participation, and the promotion of integrated water resources management.

The elaboration of a water resource master plan provides a good mechanism for the crystallization of thoughts on water policy and development programs.

Public Awareness and Involvement

It should be noted that passing legislation may not bring about the desired behavioural change. There are numerous examples of existing legislation that could contribute significantly to preserving the natural environment. The capacity to regulate effectively assumes that the required monitoring and compliance machinery is in place and functional. This is quite often not the case.

It is suggested that legislation and its enforcement should be seen as a supportive mechanism rather than the principal instrument of trying to bring about behavioural change. The desired objective is to attain voluntary compliance out of an acceptance that the environment is to be valued.

Understanding the value of the environment may come about through a program of public education.

Policy-makers must create opportunities for involvement by the populace in the decision-making process.

Legislation

An important aspect of water legislation is to define individual components of the management system, delineate their respective responsibilities and provide the necessary coordination mechanisms.

Since water management involves the individual actions of a large number of users, water legislation must also define the rights and appropriate constraints relative to such user activities. The absence of well defined rights can lead to conflict and may result in a reduction of the contribution water can make to socio-economic development.

Water legislation is not static, it must evolve and respond to changes occurring in the socio-economic development of a nation. In an effort to meet the regional challenge, the Food and Agriculture Organization (FAO) has been providing assistance to six island countries in the Eastern Caribbean—Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent, and the Grenadines. The objective of the project is to advise participating countries on the creation of a legal and institutional framework for the development, use and conservation of their freshwater resources.

Some of the issues receiving attention are:

- British Common Law is the basis of legislation in many of the region's countries. In the absence of specific statutes, a system of Riparian Rights prevails, whereby landowners have first claim on waters arising on their land or flowing next to it.

This type of legislation is typical of systems that evolved from historical legal precedence during a period when there was an abundance of water. These systems should be re-examined because water is now a scarce commodity in most countries of the region.

- The impact of land use is very apparent in the watershed. Agriculture and forestry contribute significantly to the economic and social lives of the rural poor. Charcoal burning, fuelwood and subsistence farming have caused widespread deforestation and unsustainability. This has escalated the problems of increased erosion, flood runoff, sediment in streams, landslips and lowered watershed and land productivity.
- The problems of land tenure and access to the land make proper land management difficult. Groups of individuals using the upland watersheds include landowners, renters, displaced farmers and squatters. Cultivation techniques employed by those who do not own the land normally result in declining yields and force the clearing of new areas.
- The absence of identified policies and strategies involving the rural landless in a partnership in resource management has served to exacerbate the problems of improper land use and watershed management.
- Governments of the region must formulate and implement a tenure and land-use plan for allocating areas to agriculture, tree crops, agroforestry and forestry. Such a plan must take land capability into account, as well as the need for conservation.
- Provisions for protecting watersheds from erosion and human activities that may jeopardize water resources are generally found in the forestry legislation of the region. Where such provisions exist, they are inadequate because they hinge on public lands being declared reserved forests and private lands being declared protected forests. The freedom of landowners to use and cultivate their land can be curtailed. However, there is reluctance to use the protected-forest declaration because claims of compensation may be laid for what may be perceived as taking of property. Many provisions protect watersheds that support the distribution systems and are, thus, unavailable to protect other watersheds and non-forested middle and lower reaches of the watershed areas.

A regulatory mechanism, therefore, is urgently required to protect those areas that are outside the purview of forestry legislation and that will impose effective land-use controls in the entire watershed.

Water Allocation

The small size of the islands in the Caribbean, and the conditions of development, have resulted in governments focusing on providing dependable clean water for domestic use and for use in the growing tourism industry. Jamaica is an exception, where water is used for irrigation. It should be noted that competition for irrigation water is rising and is likely to increase, especially if Professor Singh's speculations are accurate. The demand for water is likely to polarize around these two principal users in future.

Water allocation is a basic component of the water management framework. Its major goal is to achieve water management objectives. Appropriate allocation mechanisms must be established not only to shift water usage toward the most beneficial activities, but also to promote efficient water use.

Land/Water Interface

A result of the demands of a growing population and increased agricultural production is a conflict between expanding urban centers and preserving arable agricultural lands. The increase in paved areas, roof coverage and soil compaction contribute significantly to increased run-off, which is often channelled to the sea or water courses in paved ditches. The disposal of human wastes in soak-away pits often contaminates ground water. Safe systems for the disposal of solid waste and sewage must be developed.

Future requirements for sustainable development must include creating land-use policies, plans and programs for optimum land use and for establishing mechanisms for conflict resolution.

Traditionally, little or no consistent attention has been given to the integration of sound environmental practices into agricultural development projects. The traditional approach to agriculture has been primarily economic and has sometimes reflected social concerns. Environmental assessments must be included in the early consideration of project plans.

Farmers are still engaged in unsuitable farm practices that contribute to erosion, reduction of recharge to groundwater aquifers, and to watershed degradation. The uncontrolled application of insecticides, weedicides, and pesticides have contributed to the pollution of ground and surface water. It is imperative, therefore, to examine the use of land and to control the application of chemicals so as to minimize the negative impact on water resources.

III. COORDINATION

Water-management decisions are taken and implemented through an administrative framework that consists generally of separate but interacting administrative units.

The most prominent feature of water-management is an organizational structure that defines individual management units and their location within the government structure.

Coordination among individual water-management units and between water management and related programs is essential, especially in the case of socio-economic activities that generate water demand.

The complex interactions between water resources and socio-economic activities require close coordination between water managers and the decision-making processes that are outside the scope of water-management programs in many areas. Improvements to drinking water supplies and the disposal of sewage effluent are likely to be components of broader efforts to improve health, housing and social well-being. Irrigation activities must be coordinated with a variety of related activities to collectively focus on increasing crop production.

Different arms of government have assigned responsibility for the use and protection of water resources, from what may be narrow perspectives. However, the resource cannot be compartmentalized or it would lose its inherent unity.

It has become imperative to rationalize and coordinate institutions for water resources management. Resource unity and a holistic management approach must be reconciled with the diverse responsibility centers of the government. This will minimize duplications, overlap and resource waste.

Rational and integrated resource management requires mechanisms for facilitating institutional coordination. Activities that should be coordinated include: an inventory of water resources; the development and maintenance of a master water plan to guide future water resources development; the licensing, abstraction, use and control of water resources; and the licensing of waste disposal that may pollute surface and ground water.

IV. INSTITUTIONS

The key bodies involved in the region's water resources management effort are classified into the following functional areas in this brief analysis:

- water resources regulatory institutions—inventory, planning, monitoring, allocation, watershed management;
- water resources user groups—water supplies, irrigation, forestry, industrial, recreational and health;
- funding/technical support institutions—national, regional and UN agencies, International Bank for Reconstruction and Development (World Bank), Inter-American Development Bank (IDB), Caribbean Development Bank (CDB), CIDA, USAID, etc.;
- other related institutions—universities, academies of science, meteorological agencies, bureaux of standards.

Water resource institutions must be upgraded. As they are now, they are not able to perform the critical tasks that are required to implement national water programs or the other functions associated with sound management of the region's water resources. While much effort has gone into data collection, water resources management information is rare and, therefore, current databases needed to support rational allocation decisions, are not accessible.

To improve efficiency and effectiveness, national and regional support agencies should be coordinated. Regional governments must create a level of collaboration in public expenditure on water and related resource development that will increase benefits to the region's people.

Improved management effectiveness and increased coordination among the water-related agencies will go a long way toward achieving sustainable water resource development in the region.

In the region, the NGO community is even weaker and more fragmented than government agencies. Without an articulation of government policy, there has been nothing to focus on. In this vacuum, funding agencies have inadvertently added to the confusion by creating even more agencies that have single purposes and that vie with each other for attention.

Linkages between water resource agencies and planning institutions are at best, weak and certainly need to be clarified and strengthened. Relationships between the various planning institutions should also be examined.

To summarize, government agencies suffer from critical staff shortages, inadequate budgetary support and poor accommodation, transport and equipment. The NGO community is relatively weak and disorganized: planning and financial institutions need to be more closely coordinated and other related agencies need to be strengthened. It seems that, despite worthy intentions and declared policy, the region's water, environmental management and planning institutions are not capable of successfully implementing national programs for sustainable development at this time. Institutional development should, therefore, be a priority.

While the following is not definitive, it is not too early to examine the basic structure of institutional and human resource development, and to articulate some objectives for improving projects.

Immediate Objectives

To reorganize, rationalize and strengthen resident agencies and to integrate water resources management into the national, developmental process, measures should be taken to:

- raise the level of public awareness, political importance and financial and technological support for water resources management;
- improve organizational structures, management methods, and career development systems in the relevant agencies;
- improve water conservation and watershed management education, training, research and extended systems and institutions;
- improve support to local groups, NGOs and private-sector institutions involved in conservation and watershed protection;
- develop innovative mechanisms that will increase funding for water resource conservation and protection from both local and international sources, in the public and private sectors.

These suggestions are intended to indicate directions, and it is hoped they will provide guidance to those involved in formulating the institutional developmental programs so urgently required in the region.

V. WATER RESOURCES MANAGEMENT INFORMATION SYSTEM

With the advent of the "Information Age" there is worldwide recognition that information is a strategic resource in both the public and private sectors. Information technologies now available have significantly altered regional options in natural resources information management.

The application of new technologies to water resource management provides opportunities to improve management and to coordinate water-related agencies throughout the region.

Poor coordination has been a prinicipal constraint to increasing the effectiveness of water development efforts in the region. One major tool that will increase institutional coordination in the water sector is a common, accessible and accurate water resource database

that can support rational decision-making. Such a water resources management information system (WRMIS) should inform policy at the highest levels, and should be available to decision-makers in all of the related agencies.

A WRMIS should provide a basis for strategic planning and rational, operational management of the region's water resources. Regional efforts should focus on developing a WRMIS that will be regionally applicable, and suitable for export and international replication.

Objectives of a WRMIS

The overall goal of the system would be to provide an effective management tool that would be utilized by all levels of management in the water sector. Such a system should, therefore, seek to meet the following objectives:

- provide an up-to-date water resources inventory database that will indicate available water resources nationally;
- provide an integrated Water Hazard—Early Warning System that will allow water managers to predict pollution loads and other disasters. It should also allow them to formulate and implement contingency responses that will minimize damage;
- provide to decision-makers easy access to timely and accurate information on the quantity, quality and spatial distribution of the region's water resources. This information system is intended to enable rational investment planning, as well as operations and facilities management;
- provide an early alert system for water resources management to support the following operational areas:
  - hydrological forecasting,
  - natural disaster management,
  - water resources planning,
  - hydrological modelling,
  - watershed management;
- support the intra-regional transfer of technology, networking of professional support, and increased exchange of research information.

VI. CONCLUSIONS

Increased activities in agriculture, forestry, mining and quarrying, industry and tourism will put pressure on the natural resources of the Caribbean, in responding to economic demands. These activities

have grave implications for environmental sustainability. While the full effects of changes resulting from global warming are not fully understood, increases in the frequency and intensity of extreme hydrologic events are anticipated. Governments of the region will need to respond to issues that impact directly on water resources and their role in sustainable development.

Therefore, legislation should be reviewed with respect to the changing economic and environmental circumstances in the region; the interactions between water resources and socio-economic activities should be closely coordinated to achieve effective management; water allocation will become important and urgent—mechanisms for rational water allocation to competing users will be necessary; national and regional water resource institutions will have to be reorganized, rationalized and strengthened; and a water resources management information system should be developed to provide a management tool with an inventory database to assist in implementing an early warning system, investment planning and management.

The Deterioration of Caribbean Coastal Zones: A Recurring Issue in Regional Development

Leonard A. Nurse

I. INTRODUCTION

While the exploitation of coastal resources in the Caribbean is not a recent phenomenon, the concept of coastal-zone management and the awareness of its importance are new to the region. The coastal zone has traditionally been carelessly exploited and approaches to planning have been largely ad hoc, until quite recently. The widespread manifestations of coastal degradation in the last two decades reflect both poor planning and an imperfect understanding of the dynamics of the littoral system.

The recent interest in coastal conservation throughout the region is partly attributable to the following three factors: the expansion of tourism as an important foreign exchange earner and the recognition that the coastal zone is a major attraction to visitors; the increasing signs of coastal deterioration in general and erosion in particular; and increasing awareness of environmental groups, which have helped to sensitize regional governments about the necessity for effective coastal resource management.

Objectives

This paper focuses specifically on the problem of coastal erosion and conservation in the Caribbean, for it is an issue that has far-reaching economic implications for most countries. The main objectives of the discussion are:

- to review, briefly, the major uses of the coast;
- to identify causes of coastal erosion;

- to highlight recent developments and initiatives for improving management;
- to offer for consideration, some further ideas that may assist policy-makers in designing more comprehensive coastal-management strategies.

II. SIGNIFICANCE OF COASTS TO NATIONAL DEVELOPMENT

In a region where many countries are small, most less than 1,000 sq. km. in area, land loss due to coastal erosion should be a national concern. It is generally accepted that the phenomenon of coastal erosion only assumes importance where human lives, property and economic pursuits are perceived to be under threat. It is for this precise reason that the issue is now regarded by many Caribbean states as a major social and economic problem.

For many countries, the coastal zone is now a primary focus of settlement, with most urban centers either located on the coast itself, or at most, a few kilometres inland. Population and settlement maps and data from a variety of development plans for the Eastern Caribbean suggest that at least 45 per cent of the population live within three kilometres of the coast. In Barbados more than 60 per cent of the island's population reside less than two kilometres from the coast. Fishing, which is an important pursuit throughout the region, also consumes coastal space. The beach is used for hauling up and repairing boats, and also serves as a traditional market center for selling the catch. In addition, tourism, agriculture, industrial and port installations, and power generation plants all compete for valuable, but often scarce, coastal lands.

While the above list is not exhaustive, it gives some indication of the numerous groups that have a vested interest in the use of the littoral. It appears likely that any reduction in quantity or quality of the resource base, would affect the extent to which those activities can be sustained.

III. SOME CAUSES OF COASTAL EROSION

Natural Phenomena

Hurricanes

There is little doubt that hurricanes have played a significant role in the process of coastal erosion in the Caribbean. These high-energy events cause damage to the beaches and to nearshore reefs. While

the immediate beach damage inflicted by hurricanes is often great, many beaches tend to recover naturally over time. In extreme circumstances, however, (for example, Hurricane Gilbert in 1988 and Hurricanes Hugo and Gabrielle in 1989) some sediment could be permanently lost.

It is the coral reefs that suffer the greatest direct damage from hurricanes. Various studies have shown that some corals, especially the fragile branching *Acropora cervicornis*, may suffer significant damage. This was the case with Hurricane Edith in Puerto Rico and Hurricanes David and Frederic at Vieques. It is probable that this is the most likely way hurricanes cause long-term damage to Caribbean beaches. The role of the nearshore reefs in dissipating wave energy and providing sediment is well established. The stability of the beach and coastal zone is, therefore, inextricably linked to the survival of the coral reefs.

Sea-level Rise

The effect of sea-level rise on beach erosion is much less certain, given the dearth of detailed local studies for the region. However, it is generally accepted that shorelines tend to move landward in response to this phenomenon. While one is uncertain about the precise effects of past and present sea-level rise on the beaches, the phenomenon cannot be ignored as a cause of erosion. Indeed, in the event that predictions for regional sea-level rise materialize (i.e., 20.0 cm. by 2025) increased coastal erosion can be expected. With the coasts of many countries already experiencing stress from a variety of man-induced forces, severe erosion from accelerated sea-level rise is a distinct possibility. Since coastal lands are already heavily utilized throughout the region, anticipated sea-level rise may lead to increased competition for this scarce resource.

Man-induced Causes of Coastal Erosion

Although the effect of natural forces is important, there is now abundant evidence to support the view that recent significant erosion in the Caribbean has been accelerated by the actions of man.

Causal links have been established between erosion and a variety of activities, including deforestation and the destruction of sand dunes, removal of mangroves, pollution of coastal waters and the destruction of nearshore reefs, beach sand mining and construction in the active beach zone.

Deforestation and Destruction of Sand Dunes

Without exception, all Caribbean states have suffered from the systematic removal of much of the original coastal flora. Woody species and shrubs such as *Hippomane mancinella, Coccoloba uvifera, Tabebuia pallida and Coccolobis diversifolia* were ubiquitous. The "pioneer" zone consisted of well-adapted grasses and prostrate plants, some of the most common being *Sporobolus virgincus, Lantana involucrata and Ipomoea - pes - caprae.*

This unique combination of vegetation has played a critical role in stabilizing soils on the sand terrace and on the beach zone itself. Many of these halophytes can survive for relatively long periods with their roots exposed. This is especially important during periods of coastal recession, when beach sediment is deficient. Their removal, therefore, would have made the beaches more susceptible to scouring.

Inevitably, deforestation also meant that coastal dunes were stripped of their protection, rendering them susceptible to both wind and wave action. Dunes are vital sources of coastal sediment and, in some circumstances, help to reduce the amount of wave energy reaching the sand terrace. As coastal settlement in the region grew, extensive dune belts were indiscriminately levelled to provide land for construction. This is particularly true of the small islands in the Eastern Caribbean, where land is extremely limited.

Removal of Mangroves

The disappearance of mangroves has also been disastrous for shoreline stability. Mangroves are essentially halophytic and well adapted to tropical littoral environments. Their presence has a stabilizing influence on tropical shorelines, primarily because they trap large quantities of sediment. To this extent, they can provide, over many years, a reservoir of sediment for the natural beach-building process. Removal of mangroves, therefore, deprives the beach of this valuable resource.

Mangroves also trap and filter run-off landward of the beach. Hence, some of the nutrients and sediments are prevented from reaching nearshore waters. High concentrations of nutrients and sediments alter the habitat of coral reefs, which play an important role in maintaining the stability of the beach and coastal zone.

For hundreds of years, mangroves and associated species have been systematically cleared for construction, fuel and other purposes. Up to the present, expanding populations and competition for coastal space have continually put pressure on the mangroves. The recent loss of over 10 ha. of mangroves from Carli and Couva Bays, to facilitate the Point Lisas development in Trinidad, is a case in point.

Similarly, the post-1970 pollution and near destruction of the Mangrove Lagoon on St. Thomas, to provide a marina, housing and a sewage treatment plant, is another sorry tale.

Water Quality Deterioration and Impact on Coral Reefs

As increasing pressure has been put on the coasts, there has been a corresponding deterioration in nearshore water quality. The discharge of untreated domestic and industrial effluent, run-off containing agricultural chemicals, pesticides and eroded soil have been, and continue to be, a widespread problem in the Caribbean. The deterioration of Kingston Harbour, the coastal waters off Bridgetown, the Gulf of Paria and the southwest coast of St. Thomas, Virgin Islands are four well documented case studies.

Reduced growth rates and increased mortality of nearshore reefs have also resulted from poor water quality. The effects of nutrient enrichment and sediment loading on coral communities are well known. Coral reefs play a vital role in helping to maintain the stability of the beach and coastal zone; they dissipate incoming wave energy and also provide sediment to many beaches. The deterioration of nearshore water quality, now evident along many coasts, will almost certainly lead to further depletion of the beach resource.

Beach Sand Mining

Mining of beach sands is a common practice throughout the Caribbean, but its impact appears to have been most severe in the Eastern Caribbean and the British Virgin Islands. The removal of sand often leads to significant changes in beach morphology and slope and, consequently, inhibits the capacity of the system to adjust to the seasonal wave climate. In addition, where the rate of mining exceeds natural replenishment from littoral transport, a negative sediment balance results. Once there is a continual sand deficit, the role of the beach as an effective buffer to wave energy will be diminished. Indeed, the construction boom, especially in the last two decades, has consumed significant quantities of beach sand, which may never be replenished.

Construction in the Sensitive Areas of the Beach

Severe coastal erosion has also resulted from construction within the active beach zone. The failure of developers to recognize the existence of a naturally fluctuating coastline, has increased the

incidence of localized erosion on many islands. In Barbados, inadequate building setbacks on various sections of the coast have reduced the available surface area for wave energy absorption and dissipation. The result, often, is increased beach scour and severe property damage. This is especially true during periods of high-wave energy, often caused by winter swells that are generated from extra-tropical synoptic systems in the Atlantic and from the passage of tropical storms.

The effect of construction along sensitive parts of the beach may be illustrated by a further example from the Barbados coast. The beach cells of the island's west coast are bounded at the extremities by convex headlands. The direction of maximum wave energy changes seasonally, from the northwest in winter to the southwest in summer. The axis of each cell tends to shift seasonally, in response to observed variations in wave energy. There is no material change in the sand budget, but rather a shift of sediment from one part of the cell to another. In their undisturbed state, these littoral cells appear to be in dynamic equilibrium. The limbs and headlands of the cells are, therefore, the most sensitive areas of the beach. Unfortunately, numerous structures (mainly hotels) have been constructed in these sensitive zones. The equilibrium is now upset. Consequently, while the seasonal rhythm is still evident in some areas, signs of permanent sediment loss have been noticeable over the last ten years.

IV. RECENT DEVELOPMENTS IN COASTAL-ZONE MANAGEMENT

Background

Prior to the late 1970s, the concept of coastal-zone management was largely unknown in most of the Caribbean. Coastal planning, where it existed, focused on economics, almost to the exclusion of science and common sense. The results of this approach are widespread and have now become common knowledge. For this reason management initiatives now being implemented by various governments are a welcome sign, even though they are a few decades too late. These actions acknowledge that beaches and coastal zones constitute precious, natural assets that are renewable only if managed sensibly. Some of these initiatives are described below.

Establishment of Central Authority

Recently a few countries have established central agencies, with overall responsibility for beach and coastal-zone management. Trinidad and Tobago was one of the pioneers, setting up the Institute of Marine Affairs in 1976. In 1983, a Coastal Conservation Office was established in Barbados—funding has already been provided for its institutional strengthening by the IDB, with a view to making this office the focal point for coastal management on the island.

While Trinidad and, to a lesser extent Barbados, have made meaningful attempts to centralize responsibility for coastal management, there has not been a major thrust to do so across the region. However, once other countries realize this is an effective strategy, it is anticipated centralization will become more widespread.

Improvements in Legislation

Many countries have begun to upgrade and extend legislation relating to various aspects of coastal management. Unfortunately, most governments have opted to deal with each problem as the need arises (e.g., setbacks), rather than drafting comprehensive measures. The British Virgin Islands, with its new *Coast Conservation Act*, is one of the few countries to employ a comprehensive strategy. A similar approach is to be adopted by Barbados, when the Coastal Conservation Feasibility study begins later this year.

Scientific Studies

Major scientific studies, designed to achieve a better understanding of the complex interrelationships of the coastal system, have been undertaken or are being planned in a number of countries. These studies include coastal erosion research (Barbados 1983, Netherlands Antilles 1986-88, Trinidad 1988), water quality and reef surveys (Trinidad 1987, Barbados 1989), and sand resources estimation and beach sand mining (St. Lucia 1985, St. Kitts 1988, Netherlands Antilles 1982). A comprehensive, integrated coastal-management project to be conducted over a three-year period (with aid from the IDB) will be implemented in Barbados in 1990.

Marine Parks and Scientific Reserves

As coastal and marine habitats disappear, some attempts are being made to preserve some of these unique sub-systems by establishing marine parks and reserves. Shoal Bay Marine Park (Anguilla), Cabrits Marine and Terrestrial Park (Dominica), Folkestone Marine Reserves (Barbados), and the Saba Marine Park are products of this growing trend.

V. CONCLUSIONS

Although the developments referred to above are certainly a step in the right direction, it is still uncertain if there is a full commitment to sound coastal management practice in all countries. In the absence of such a commitment, even the best strategies will not be effective. Nevertheless, as we build on these and other initiatives, the following suggestions are offered:

- A clearly enunciated, overall policy is needed for the development of coastal resources in each country. With the possible exception of Trinidad and Tobago, clear guidelines, with stated policy aims and objectives, have not been adopted. In the absence of such a policy, initiatives such as revamping institutional arrangements and enacting legislation might lose focus, so that management strategies may not be effective.
- Coastal managers and policy-makers must, as a priority, assess all alternatives for viable land use and devise a range of strategies for implementing these alternatives. This would ensure that countries minimize the risk of consigning valuable coastal resources to uses that might foreclose other options, some of which might be more successful both environmentally and economically.
- In a region of scarce resources, allocation of coastal assets must be guided by the principle of multiple uses. Once use conflicts are resolved, economic returns can be maximized without harming the resource base.
- The strategies used to achieve the objectives of coastal management must be flexible, so that they can be effectively modified as new information becomes available, or as national goals change. We must remember that we have an imperfect understanding of the coastal system, so that our management strategies, however well conceived, are bound to have inherent limitations.
- The planning and management processes should incorporate the participation of all user groups, including the general public.

Any management plan is more likely to be successful if all participants perceive they are making a contribution. Coastal resource management is no exception.

- Finally, we should strengthen existing regional institutions, such as the CEHI and the Centre for Resources Management and Environmental Studies at the University of the West Indies (CERMES, UWI), which already have some capability to train personnel in various aspects of coastal management.

Tourism and Sustainable Development in the Caribbean

Ivor L. Jackson

I. INTRODUCTION

Caribbean tourism has grown appreciably since the 1970s. This is mainly due to deliberate policies instituted by regional governments to expand the hotel plant, to accommodate tourists vacationing in the region, and to encourage cruiseships to call at Caribbean ports. These policies had an overriding socio-economic goal of providing jobs, foreign exchange and government revenue. These aims have been met to a large degree, but at heavy costs to the environment.

Management of the coastal and marine resources, on which tourism is sustained, is yet to be integrated into developmental strategies. Until recently, environmental advocates encountered political indifference to the plight of critical resources. Now, however, signs of beach deterioration and visible changes in the quality of the Caribbean waters are bringing about political awareness.

The next critical step is to facilitate policy initiatives that will bring about a desirable change in coastal and marine resource husbandry and, at the same time, sustain the quality of tourism. Such initiatives should focus on rescuing beaches, coastal areas and the Caribbean Sea, together with their resources, from further deterioration. Clean landscapes and developed attractions must become an integral part of any strategy for achieving more healthy and attractive environments. This is fundamental to the successful marketing of regional destinations as we move toward the turn of the century. Effective environmental management implies costs that must be met to a large extent by regional taxes or other mechanisms. As well, budgetary allocations for resource management should be increased. This paper:

- summarizes the information available, based on performance and trends in Caribbean tourism;
- briefly describes some of the issues and impacts that result from tourism's use of marine and coastal resources;
- presents recommendations that look at tourism in the context of a wider public policy framework for sustainable development in the Caribbean.

For the purposes of this discussion, the Caribbean includes member countries of the Caribbean Tourism Research and Development Centre/Caribbean Tourism Organization (CTRC/CTO) and other countries included in its *Caribbean Tourism Statistical Report*, 1987.

II. CARIBBEAN TOURISM PERFORMANCE AND TRENDS

International tourists vacationing in the Caribbean more than doubled between 1970 and 1987, from 4.24 million to 9.65 million. World-wide arrivals increased from 168 million to 335 million in the same period, while cruise passenger arrivals to the region increased from 3.4 million in 1981 to 5.6 million in 1987. The region accommodated its stayover visitors in 107,000 rooms in 1987, and the expansion plans of a number of countries could increase this figure to 133,750 rooms by 1991.

Most of the new rooms are likely to be built in developed coastal areas, and this expansion may cause coastal resorts to become congested before basic services are in place. The implications for beach and coastal water-quality management, and other resource management issues, will be discussed later in this paper.

Caribbean cruise passenger accommodations grew by 25,000 berths between 1982 and 1987. Approximately 70 ships, having about 60,000 berths, cruised the Caribbean in 1987 (Organization of American States (OAS), 1988). Presently about 39 per cent of the world's cruiseline companies operate ships in the Caribbean, and this figure is expected to grow to 53 per cent by 1991. The Caribbean, therefore, is growing in stature as the world's most popular cruising destination. Regional governments have been deliberate in their policies to facilitate growth in cruise tourism by investing in berthing and related shopping facilities.

It is not uncommon for a Caribbean town of less than 50,000 people to have 10,000 cruiseship passengers disembark at its deep-water harbour, choking the town's main circulation arteries and overburdening the urban waste management infrastructure. Considering cruiseships are getting bigger, with cruiseship crews constituting up to 1/3 to 1/2 of the passenger capacity, the

management of cruiseship wastes in the region becomes even more important.

There are two other major tourism activities that require special management and that, perhaps for statistical accounting reasons, are often included among vacationing tourists—yachting and scuba diving. Although reliable figures are not available, an increasing number of tourists come to the region specifically for a yachting or scuba diving vacation. The United States provides the largest market for diving in the Caribbean, having 1.2 million active divers. Based on a 1987 subscriber survey, *Skin Diver Magazine* claims that the U.S.A. scuba diving market is growing by 250,000 new divers annually, and lists six Caribbean countries as being among the ten top destinations for United States divers.

Scuba diving is poorly managed. Expansion is largely due to initiatives made by the private sector. Dive sites are normally selected by the private sector with indifference to existing uses—mainly fishing—and are usually not monitored for impacts. Yachting has been stimulated in the region by well organized international, annual sailing regattas being held in various countries. Sport fishing, as well, has benefited from tournaments being organized in various countries. Growth in both areas requires major investment in berths and associated marina facilities, which are quite often constructed in sensitive coastal environments. Dredging and landfilling to create artificial marina basins may cause critical, and very often, irreparable damage to coastal habitats; i.e., mangroves, seagrass and coral reefs.

III. MAJOR RESOURCE MANAGEMENT ISSUES

Beaches

In the marketplace, the predominant image of the region is that of a sun destination. Beaches and climate are the major natural assets that are promoted in marketing regional tourism and resort hotels. Caribbean beaches are under erosion stress for two major reasons: the use of beach sand as a fine aggregate in construction, and the irrational building of tourism structures in active beach zones. Beach management problems are documented for St. Lucia by M. Williams and E. Towle in the *Proceedings of the Caribbean Seminar on Environmental Impact Assessment* (1985).

The region is using sand much faster than it is being replenished, to satisfy the preferred method of construction; i.e., concrete blocks. Based on cement importation records, the estimated OECS use of sand for construction in 1987 was about half a million tons. Tourism facilities may not be the major construction users of

sand, but widespread use of concrete block construction can be traced to the emergence of tourism in some countries. Extensive, as well as intensive, development of regional beaches in the past three decades has evolved from tourism growth.

A major challenge facing the region is to slow down the mining and irrational building practices that have an adverse effect on beaches. The fundamental conflict between beach use for recreation and leisure purposes and the removal of sand for construction purposes must be resolved if coastal environments and beach tourism are to survive.

Recommendations

- Regional governments must come to grips with the magnitude of the beach management problem.
- Policy and institutional mechanisms must be put in place at the national level: to reduce the volume of sand used in construction, either by relying more heavily on alternative sources of fine aggregate sand and/or on resorting to other building materials; and to facilitate more rational building practices and use of land in or adjacent to active beach zones.
- For obvious reasons, the region must improve its technical capacity to manage beaches effectively, giving due consideration to impending sea-level rise: through selectively monitoring beach accretion and erosion rates and tidal levels; and by applying coastal engineering to sea defence and beach-improvement schemes.
- While regional governments should solicit international financial and technical assistance in support of the above efforts, they must be prepared, as a matter of policy, to collaborate with the local tourism industry and bear most of the costs for beach management.

Waste Management

Liquid Waste - Sustaining Productivity and Quality of the Caribbean

The nearshore waters surrounding Caribbean countries are not generally rich in nutrients and phytoplanktons, and the productivity of coastal fisheries in these countries depends to a large degree on a complex relationship between mangroves, seagrass and coral reef ecosystems. Tourists' demand for lobster, fish and conch is one of

the best examples of inter-sectoral links between tourism and other industries.

It is perhaps fortunate that the low levels of nutrients and phytoplanktons allow coastal waters to remain relatively clear, so that light penetration encourages fairly good coral development. Scuba diving among the region's coral reefs has become a major tourist recreational activity, while snorkelling and the viewing of reefs from glass-bottom boats are popular tourist attractions as well.

In addition to its productive and recreational value, the Caribbean Sea absorbs waste and, in most cases, renders it harmless to humans and marine organisms. However, untreated domestic sewage effluent and/or industrial effluent from some of the region's tourist resorts and coastal urban centers may be sufficiently concentrated to weaken the cleansing capacity of the sea. Storm water run-off also contributes to this effect. In the *Proceedings of the Caribbean Seminar on Environmental Impact Assessment* (1985), B. Wade attributes phytoplankton blooms, fish kills and aesthetic degradation in Kingston Harbour, Jamaica to a combination of domestic sewage, industrial wastes and stormwater run-off. W. Hunte found nitrates and phosphates in the Grand Anse Resort bay sufficiently elevated to cause eutrophication stress to corals. A. Archer concluded that sewage and other wastes from urban areas, which have fairly large numbers of hotels and other facilities catering to tourists, have destroyed fringing reefs on the south coast of Barbados.

Tourism's direct contribution to the liquid waste of the region may be minor. However, the many resort areas of the Caribbean can and periodically do contribute to elevated levels of pathogenic bacteria and nutrients, contaminating adjacent leisure and recreational waters and, thereby, creating both a health risk and an aesthetic problem for tourism. The situation will get worst as the hotel construction boom that started around the mid-1980s continues.

CTO claims total room accommodation in Antigua/Barbuda, Curacao, Dominica, Grenada, St. Kitts/Nevis, St. Lucia, Tobago and the Turks and Caicos Islands is expected to increase from 9,660 at the end of 1989 to 17,000 by the end of 1992. There is no evidence, however, to suggest that plans to install or upgrade the sewage waste infrastructure in the region will match the growth in resorts and other urban areas going into the year 2000. During the next ten years, one of the major challenges faced by regional and national policy-makers will be to arrest and, thereafter reduce, the impact of liquid waste on the Caribbean Sea.

Solid Waste

There is hardly any Caribbean country where part of the landscape is not defiled by household litter, abandoned vehicles and tires, construction debris and other forms of solid waste. Litter problems derive from the attitude of resident populations and from a reluctance to enforce anti-litter laws. Poorly managed dump or landfill sites exist for a number of reasons: improper site selection, inadequate site management (often attributed to lack of funds for equipment), and from political indifference and institutional negligence.

In this paper solid waste is dealt with as a coastal and marine resource-use problem because many dump/landfill sites are located in or near wetlands, or are adjacent to river banks, estuaries and cliffs, and a significant percentage of total waste volume is produced directly by yachts, cruiseships, hotels, restaurants and other tourist industry service facilities.

It is estimated that tourism directly contributes a small amount of garbage to the total volume of the region compared to other sources, but one cannot deny that the socio-economic impact of tourism on the consumption habits of local populations may indirectly contribute to the overall solid waste stream, particularly in some smaller countries, where tourism's contribution to GDP (direct and indirect) may be over 50 per cent.

One of the major goals in the development of the region must be to safeguard the health of residents and visitors. Unkept, or poorly sited, dumps and/or landfills may cause infestations by flies and rodents, as well as contamination of rivers, streams, other water courses, wetlands, underground lens of fresh drinking water and coastal water bodies, and may be injurious to health. In addition, an aesthetically degraded environment is a detriment to tourism.

Recommendations

- Regional and national policy initiatives must reinforce goals for achieving safe health for residents, visitors and marine organisms. Within this context, we must consider streamlining the institutional arrangements for waste management. I believe, for example, that efficiency and cost savings could be achieved by consolidating regulatory functions for solid, sewage, agro-chemicals, industrial and other wastes under one agency.
- With respect to tourism, two of the major objectives that should be considered in future waste management are: maintenance of coastal water quality for health, recreational and aesthetic reasons, and maintenance of coastal ecosystems' productivity,

whose link to commercial fisheries and, hence, to tourism is well established.

- Regional co-operation in facilitating realistic pollution control standards should be strengthened without delay, given the rapid expansion of tourism facilities and the increased number of visitors anticipated in the region over the next ten years. Standards should be considered for effluent discharge from hotel package treatment plants, resort municipal sewage treatment plants, and various parameters relevant to water quality.
- Given the alleged constraints to financing a waste management infrastructure, regional collaboration for agreement on an equitable system of levying charges or taxes should be sought at the national level on: cruiselines, for disposing of cruiseship wastes—in St. Thomas, United States Virgin Islands (USVI), the Port Authority incinerates cruiseship solid wastes for a fee, but on some other islands the disposal fee is charged by a private waste-transporting company and not by the public agency managing the landfill, and hotels, commercial facilities and residences using package or municipal sewage treatment plants.
- As a matter of policy, broad-based initiatives should be taken by relevant government agencies, with assistance from the private sector, on public education and awareness, particularly with regard to littering.

Land/Coastal Uses Planning and Development Control

Coastal tourism is a dynamic developmental force in the region. The industry's ability to generate jobs, foreign exchange and government revenue makes it pivotal to the developmental strategies of several countries. However, the coastal environments of these islands are characterized by dynamic and complex processes and by inter-relationships between ecosystems and, depending on the locality, may be exceedingly vulnerable to developmental stress.

The negative repercussions that accompany developmental stress can be minimized by having in place strategic plans for land and marine uses in coastal areas, and by exercising development control and area protection through relevant institutional mechanisms. Integration of developmental and environmental policies is necessary in this context, and regional governments must consider making a major policy shift in this area for the sake of the future. By and large tourism developmental strategies have been rigorously pursued without expending equivalent energy on managing the natural resources upon which tourism depends—landscapes for scenic

pleasure and inspiration, whether journeying by land or sea; beaches for leisure and recreation; coral reefs for diving and snorkelling; offshore cays for a variety of pleasures; geo-physical and other natural wonders that tourists find attractive. This approach not only degrades resources that are valuable to tourism, but that are valuable to other industries as well—notably, fisheries. Policy initiatives are needed for a more rational use of marine and coastal resources for tourism. These initiatives should, in some cases, upgrade or adjust staff, laws, enforcement and inter-agency co-operation mechanisms.

Land Use

- One of the most pressing needs in the region is the revision of land-use policies so that more effective control of physical development can be rationalized and exercised, where necessary, by planning mechanisms (e.g., national, physical development plans, specific area or master plans, etc.), or legal and regulatory mechanisms (e.g., enabling legislation and zoning regulations).
- A major objective in the implementation of land-use policies should be the protection of environmentally sensitive areas and important resources from tourism and other forms of development. Wetlands provide one example.
- A critical policy initiative that should be adopted as a legal procedure within the land-use and development-permit process is EIA.
- Critical policy initiatives must be taken that will influence the nature of medium and long-term tourism development in coastal areas:
  - Building in active beach zones is not an environmentally safe or cost-effective option, given the relative frequency of hurricanes and the predicted rise in sea levels. Well thought out minimum setback standards for building must be applied to allow beaches to reach a new equilibrium if shorelines recede, and to help reduce the cost of shoreline preservation.
  - Vistas of the sea, public coastal space and public access to beaches are increasingly being threatened due to heightened demands for coastal land for tourism development, accompanied by a rise in land values. Notwithstanding the widespread desire to maintain the Caribbean style in architecture, high-rise structures are more appropriate in tourism resort areas and provide a more efficient use of scarce lands, while responding to public coastal recreational

needs. A corresponding improvement of sewage waste management should be imperative.

- The policy initiatives outlined above may require the technical and administrative capacities of relevant agencies in some countries to be upgraded.

Landscapes and Other Attractions

Scenic landscapes and other natural attractions provide the basis for tourism in most of the world and their value in the region to the industry must be fully appreciated. While scenic values are largely subjective, consensus can be reached on landscapes that should remain largely unaltered by the built environment. Landscape and attraction policies should seek not only to preserve, but to enhance and promote such areas for public enjoyment.

Protection of Coral Reefs and Other Sensitive Areas

Caribbean governments are generally hesitant to implement coastal and marine protection policies because quite often environmental policy advocates appear not to be sufficiently sensitive to socio-economic imperatives. A typical lagoon or sheltered bay may be valued on the one hand for the environmental importance of a complex association of mangroves, seagrass and reefs and on the other hand for the benefits derived from a range of socio-economic uses; e.g., yachts, cruiseships, ferry boats, marina services, seaplanes, houseboats, diveboats, etc. This is a dilemma for advocates of both environmental and economic policies, particularly in small countries with high population densities, because the desirable compromise between strict area protection and socio-economically driven resource exploitation is not well understood by these groups.

The understanding that evolves from a dialogue between these groups could provide the basis for coastal/marine resource use and area protection policies:

- In response to the steady growth in yachting, cruiseships, diving, commercial and sport fishing activities, etc., the widest possible application should be made of multiple-use marine areas.
- Zoning provisions should be established that would reduce conflicts and protect sensitive resources against certain uses in multiple-use areas.
- Criteria should be laid down for the selection of dive sites and anchorages for yachts and small cruiseships that would avoid

conflicts with fishing, anchor damage to reefs and seagrass and congestion of some harbours, all of which now occur in the region.

- A scuba diving policy should be devised that would protect reef ecology and traditional fishing rights by establishing a management regime that would determine the reefs to be used for diving and licensed dive operators, and would monitor and rotate uses as necessary as well as secure maximum income and revenue compensation from use of selected dive sites. Thus, major dive sites would be treated as economic assets over which there must be effective management for sustained use.
- Policies on boating uses should achieve a systematic designation of anchorages for yachts and small cruiseships that would avoid stressing environmentally sensitive areas, and, where necessary, would provide realistic infrastructure services; e.g., pump-out facilities for sewage and receptacles for garbage.

- A realistic assessment should be made of the relative value of mangrove/wetland areas to use as the basis for deciding those that require absolute protection, in the event that choices have to be made.

IV. OTHER SUGGESTIONS FOR SUSTAINABLE TOURISM

The next ten years will be critical in determining the long-term nature of tourism activities in the region. The effects of mass tourism can already be seen. Larger hotels, more condominiums and more cruiseship berths will exacerbate existing problems. From an environmental point of view, the industry is poorly managed. Although not as obvious, one could make similar statements about the socio-economic and cultural aspects of tourism. For example, is the revenue from tourism proportionate to the increase in tourist arrivals? If not, where should the money come from to pay for managing the natural resources used by the industry? Continued growth of regional tourism, which can be justified for socio-economic reasons, requires critical policy shifts that may not always appear politically or financially feasible.

Tourism Promotion and Marketing

Better management of regional tourist areas should be an integral part of tourism promotion and marketing. Regional policy must

grasp the principle that a managed tourist area with a clean landscape, well developed natural and cultural attractions and a reasonably well maintained environment is fundamental to a successful marketing strategy. Littered landscapes, bad roads and smelly towns require hard-sell techniques in the marketplace and, consequently, command larger promotional budgets.

Tourism Growth

Re-assessment of tourism growth indicators is needed. Stayover and cruise passenger arrival figures are not necessarily accurate indicators of the industry's economic impact.

Cruiseship Berthing Facilities

Options to locating cruiseship berthing facilities in downtown areas should be considered. Recent trends in locating cruiseship berthing and shopping facilities at downtown waterfronts have, in some cases, aggravated chronic urban congestion and traffic circulation, and have inconvenienced residents. The occasional unloading of several thousand cruiseship passengers in small towns that do not have piped sewage only adds to the liquid waste management problem.

Data Base Use

Improvement of the data base to facilitate sound policy decisions on the industry is required. The paucity of data on the volume, impact and economic value of yachting and scuba diving activities is particularly critical in respect of coastal and marine resource conservation.

Parks and Protected Areas

Legally created parks and protected areas should be integrated into national and regional developmental strategies. Coral reefs, rainforests, coastal watersheds and outstanding landscapes are particularly relevant to tourism.

Revenues

Traditional and new, imaginative avenues must be explored for the use of coastal and marine resources, to enhance tourism revenue. One could argue that, in the region, the tax base of the tourism industry bears no relationship to the type and level of natural resources it exploits. For example, given the importance of beaches to room-rate charges, a case could be made to set the tax rate of beach hotels three per cent higher than properties in non-beach areas. Revenue could also be obtained from implementing a concessions policy that would govern economic activities involving protected areas and/or heritage resources.

Resource Management Costs

Governments must be prepared to shoulder a greater proportion of the costs of resource management. Dependence on external agencies to cover major portions of the technical and financial costs for the management of natural resources cannot go on indefinitely. Funds must be raised domestically to cover these costs by instituting tax measures, non-governmental mechanisms and by shifting national expenditure priorities.

V. CONCLUSION

Environmental problems related to tourism may be quite alarming, but sustainable tourism development does not imply the automatic curtailment of growth. It is conceivable that the region could accommodate twice as many tourists with significantly less resource degradation. This requires the integration of conservation and developmental policies, and a willingness to invest in the human and institutional capacity in order to improve management of the coastal and marine environments of the Caribbean.

Science, Technology and Sustainable Development in the Caribbean

Desmond A. Ali

"No Man is an Island, entire of itself
Every Man is a piece of the Continent,
a part of the main
If a clod be washed away by the sea, Europe is the less
As well as if a promontory were
As well as if a manor of thy friends or
if thine owne were
Any Man's death diminishes me
Because I am involved in Mankinde
And therefore never send to know for whom the bell tolls
It tolls for thee."
(John Donne, *Devotions XVII*)

I. SUSTAINABLE DEVELOPMENT — A CONCEPTUAL FRAMEWORK

In its 1987 report, *Our Common Future*, The World Commission on Environment and Development defines sustainable development thus:

> ". . . to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits—not absolute limits but limitations imposed by the present state of technology and social organization, on environmental resources and by the ability of the biosphere to absorb the effects of human activities."

Implicit in this definition are human needs, technological capability, the concept of resources and limits, and ecological stability. I want to examine some of these concepts in the light of science and technology. While recognizing the universality of science and technology and the interdependence of nations, I intend to use the Caribbean sub-region as my major point of reference.

In doing so, I suggest that sustainability, in an economic and social sense, has a broad connotation. First, it implies an internal energy and drive with a high degree of self-support, self-reliance and maintenance. Second, it implies national pride, dignity and self-esteem. Third, it implies a sustainable competitive advantage in the international scheme of things.

II. THE CARIBBEAN SUB-REGION — A BRIEF

The sub-region of the Caribbean Community comprises thirteen independent English-speaking countries ranging in size from approximately 100 km^2 to 215,000 km^2, with a total area of 272,000 km^2. Population varies from 12,000 to 2.3 million and totals 5.5 million. Average population density is 20 per km^2, ranging from 4 to 588. The countries can be described as tiny, with relatively open economies, a standard of living that is higher than most Third World comparisons, and is characterized by high rates of population growth (approximately 1.4 per cent), high open unemployment rates (12.0-25.0 per cent) and high net migration rates (-6 per thousand in Barbados in 1970-80 to -99 per thousand in Jamaica in 1982).

III. MANAGEMENT, POLICY AND DEVELOPMENT 1960-89

If one agrees the elements that go toward making up a scientific and technological policy are

- human resource development,
- imports of science and technology, and
- indigenous research, development, design and demonstration,

then, in the spirit of Keynesian tradition, state intervention to facilitate the role of science and technology in development has been embraced by all governments in the sub-region. The embrace, however, has occurred with varying degrees of enthusiasm, ranging from negligible to small.

In the early post-independence era (i.e., the 1960s and 1970s), the sub-region's development policies—particularly those pertaining to science and technology—were characterized by ignorance, myth and misconception.

Ignorance imposed on the sub-region traditional economic policies, where land, labour and capital were the main components of production and where inward-looking paths to development were assumed. These policies ignored the work of economists like Abramovitz and Solow who, since the early 1950s had been seriously and quantitatively analyzing the determinants of growth at the macroeconomic level. Their studies showed a huge gap (up to 60 per cent) existed between growth of GNP and growth in conventionally measured inputs of labour and capital, and that major sources of economic growth lie in technological innovation and institutional reorganization.

The notion that the mere existence of scientific and research institutions and councils would necessarily contribute to economic change was a myth. The proliferation of such institutions and councils in the sub-region has been an unhappy story. Many of these have either aborted or have remained marginal and inconsequential to the technological requirements of the countries concerned. Institutions that have dealt with local problems or developed technical innovations, have not transmitted them to the productive sectors.

The assumption that technology was readily available and could easily be obtained via technology transfer arrangements was a misconception. The failed projects, low levels of capacity utilization, reliance on imported inputs, and low efficiency and effectiveness ratios all bear testimony to inequitable negotiation, inadequate information, unreliable salespersons, deficient adaptation and unfavourable contractual arrangements. If there are lessons to be learned from all of this, they are evident in our present situation. As a microcosm of the Third World, the Caribbean sub-region presents opportunities for research in disaster management.

Policy in the 1960s and 1970s did not stress the role of human resource development, nor the building up of indigenous technological capability. Thus, while every country in the sub-region can justifiably be proud of literacy levels (usually in excess of 90 per cent), the sub-region as a whole can be characterized as technologically illiterate and scientifically backward.

After the 1970s, attempts to articulate policy, build capability and improve the general level of science and technology within the various countries have been spotty and variable. In the three larger countries (i.e., Jamaica, Trinidad and Tobago, and Guyana) institutions have been set up without a clearly articulated policy. Now, there is an infrastructure searching for a policy. In Barbados,

there is some semblance of a systematic approach, but it is diffuse and needs to be focused. The smaller territories of the Eastern Caribbean and Belize all lack policy, planning, institutions and personnel.

Throughout the sub-region, there are two characteristics of science and technology that merit special comment:

- One is the exodus of professionals and technicians to more challenging and lucrative positions abroad. In some cases, the "brain drain" has occurred because of economic collapse, and political and social disorder. Even the regional and international intergovernmental organizations, which were set up to stimulate and assist development, have played a part by attracting some of the best talent, in many instances to mere paper-pushing jobs.
- The other is the excessive reliance on donor-supported projects, many of which have been marginal, insignificant and of questionable merit. Such projects have served to channel the few remaining resources away from crucial tasks.

Both of these characteristics have been attributed to policy-makers paying inadequate and insufficient attention to science and technology in the developmental process. In such a context, any talk about sustainable development becomes meaningless rhetoric and could easily degenerate into a buzzword for lack of action.

The impact on economic development in the sub-region has not been a happy one. The elements of economic development include growth and other well-defined criteria that should provide inter alia satisfaction of basic needs, reduction in unemployment and income inequality, and the achievement of egalitarian objectives. The Commonwealth/Caricom Secretariat report, *Caribbean Development to the Year 2000: Challenges, Prospects and Policies*, published in June 1988, shows that viewed in these terms:

> "On the whole, the standard economic indicators of development performance tell a dismal tale. Real per capita GDP growth rates for the post 1980 period have been negative in many countries. This is a consequence in a statistical sense of double digit inflation and population growth. Furthermore, the structure of domestic output remains highly concentrated on a few sectors, with distribution services and government services being prominent in all countries and manufacturing failing to take-off into a dominant position. Unemployment has become a greater problem than in the previous decade. . . ."

The same report concludes:

> ". . . Altogether, the survey of development performance provides no grounds for comfort."

IV. TECHNOLOGICAL CHANGE AND DEVELOPMENT

The Industrial Revolution, with its infinite capacity to convert the earth's raw materials into finished goods, heralded the onset of an era of exploitation and growth that previously would have been unimaginable. J. F. Richards points out in *Sustainable Development of the Biosphere* (1986), ". . . the accelerating extension of world agriculture, industrial development, urban settlement, mining and large scale fishing have all contributed to the transformation of the world's environment."

These powerful motivational forces show no signs of abating, and one will certainly see a fivefold to tenfold increase in economic activity over the next one to five decades. Much of this activity, especially with respect to industrialization, is expected to occur in large parts of the so-called Third World.

The developed world was shocked in the early 1970s by the emergence of the Organization of Petroleum Exporting Countries (OPEC). It was recognized that the Third World was no longer content to be "hewers of wood and drawers of water," but had developed economic clout on the international scene. The rapid increases in the price of energy thereafter, followed by fears of similar increases in other commodities and raw materials, propelled a rate of technological change unparalleled in the history of human development. This rate of change has developed a momentum over time that feeds itself and continues to accelerate.

Developed countries have mitigated the effects on their economies of actions taken by commodity producers by significantly and rapidly reducing the use of energy and raw materials. This is true for both product and process technology.

To illustrate the reduction in total energy use, there used to be a direct correlation between energy consumption and GDP. Yet in OECD countries between 1973 and 1985, total energy use per capita fell by six per cent, while per capita GDP rose by 21 per cent.

In product technology, major developments, relating to both industrial and consumer goods, have had a significant effect on increasing productivity. In refrigerator technology, for example, annual electricity requirements for typical two-door, frost-free refrigerator/freezers of the 450-510 litres (16-18 ft³) size have fallen from nearly 2,000 kwh in 1972 models to 1,200 kwh in 1983 models,

and to 750 kwh in 1985 models. New models just out will use only 480 kwh.

The same applies to other consumer durables and goods, including motor cars, food products, housing and clothing, as well as industrial products, such as glass fibres and computers. It now takes 22-45 kg of optical fibre to convey as many telephone messages as one ton of copper wire, while such fibres use only 5 per cent of the energy used by copper wire. Similarly, the first submarine transatlantic coaxial cable of 1956 allowed only 36 simultaneous telephone conversations, while the first optical fibre cable of 1988 carried 40,000 calls. The first electronic computer, ENIAC at the University of Pennsylvania, was gargantuan in its use and output of energy. The modern PC is infinitely faster, has more capacity, uses a fraction of the energy and also costs a fraction of the price.

In process technology, new developments in information technologies, biotechnology, materials technology and energy technology provide examples of major reductions in the use of energy and raw materials and in generation of waste.

Further, it is technology that makes resources. This was well argued by T. de Gregori in *Technology and the Economic Development of the African Frontier* (1969), who showed that were it not for the technology of shaping, mounting and hurling, flints would just be stones on the ground. Similarly, were it not for the technologies of prospecting, locating, producing, refining, distributing and using, crude oil would still be some black stuff underground.

Within the last two decades, three fundamental changes have occurred in the very fabric of the world economy.

- the primary products economy has become "uncoupled" from the industrial economy;
- in the industrial economy itself, production has become "uncoupled" from employment;
- capital investments, rather than trade, have become the driving force of the world economy.

Overall, therefore, one sees less pressure on natural resources and less waste from agriculture, energy and industry. Declines in the raw materials going into manufacturing products and processes is paralleled by a rise in the knowledge content, typified by more research information and a more qualified work force and management.

V. TOWARD THE 21ST CENTURY — SCIENCE AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT IN SMALL ISLAND STATES

The Issues

The UNESCO Man and the Biosphere Programme (MAB) and the Biosphere Inter-Oceanic Workshop on Small Islands held in Puerto Rico in November 1986 identified 20 key issues that faced countries such as ours in the sub-region. They are: sustainable development, diversity of islands, open specialized economies, private-sector involvement, distortions in island economies, transport, demographic issues, employment, decision-making, natural resources, forestry, land management, water, energy, conservation, coastal and marine geosystems, fisheries, agriculture, industry, tourism and allied services.

I believe these issues are subordinate to the key issue of how to deal with internally propelled growth and development. At the same time, we must recognize that our small island states are vulnerable to outside economic, technological and social forces—forces that are beyond our control. As small islands, with only a limited range of exploitable resources, limited manpower and limited economic means, our options for ecologically and economically sustainable development are restricted. The same UNESCO Workshop emphasized our smaller margin for error and our smaller capacity to absorb environmental stress than larger areas.

The Role of Science and Technology

The major objective of any scientific and technological policy must be to use scientific and technological techniques to satisfy the basic needs of our people for food, shelter, clothing, health, education and leisure. In fact, not only must science and technology be used to satisfy these needs, but to improve the standard of living of all our peoples in every sector of society. As well, such improvements must not come about at the expense of our sovereignty, our environment or our cultural heritage.

To meet this objective, scientific and technological policy must adopt a three-pronged approach. It must emphasize human resource development at every level, the importation of technology and the stimulation of indigenous R&D. There are critical shifts in policy that must be addressed if the imperatives of sustainable development are to progress beyond the stage of wishful thinking. These include:

National Planning and Infrastructure

- link scientific and technological considerations to national planning;
- develop an infrastructure;
- set priorities and give focus.

Human Resource Development

- develop manpower planning;
- create modern training modules;
- review science and technology curricula in primary and secondary schools;
- expand technical-vocational education;
- upgrade professional training.

Technology Importation

- accelerate the introduction of new and more appropriate technology;
- build up capacity for the assessment, evaluation and acquisition of technology;
- link technological imports to indigenous efforts in science and technology; e.g., R&D, training, standardization, etc.

Indigenous R&D

- explore relevance and focus of R&D;
- examine funding of R&D;
- assess effectiveness of R&D efforts.

Linkage of Science and Technology to Production

- impact on production of goods and services;
- open up new opportunities;
- encourage productive enterprises to fund elements of science and technology.

Financing Science and Technology

- establish quantum of public funds to be available;
- devise incentives for private funding;
- reduce reliance on outside funding.

Innovation and Entrepreneurship

- encourage and stimulate innovation and entrepreneurship;
- improve productivity in the public sector through technology;
- emphasize productivity at every level of society.

Indicators of Scientific and Technological Performance

- collect data;
- evaluate impact of science and technology on society.

Regional and International Co-operation

- co-operate and collaborate to raise size criticality;
- develop and strengthen regional organizations;
- coordinate responses to international agencies.

Science and Technology, and Society

- popularize science;
- encourage creativity and innovation;
- develop technological literacy.

The bottom line is that science and technology must not only support development but must direct sub-regional development and so establish a society with self-esteem and self-reliance, one that can appreciate and implement actions for sustainable development.

Science and Technology, and Sustainable Development

It is clear from the analysis provided that the sub-region does not have in place either a policy or an infrastructure for using science and technology to achieve sustainable development. On the one

hand, the economies of all countries of the region are fragile and highly dependent on external forces. On the other, the crucial need to maintain and sustain high levels of technological imports is not matched by an indigenous capability to search, identify, evaluate and negotiate for such technology.

It is also clear that science and technology subserves the interests of the present economic industrial system and is a major factor of inequality between nations and, indeed, between different strata of people within a nation. To take this point further, it is true to state that science and technology is a major element in the military industrial complex and this continues to sustain such inequality and, in fact, to inflict much human suffering.

In the context of these statements, what can the sub-region hope to achieve in sustainable development through the use of science and technology?

- As a microscopic part of the world system of science and technology, it is implicit for us to become better informed, more selective, more discriminating and excellent negotiators. This calls for quality in our human resource base, and a superb information infrastructure using the latest technology.
- We must become more focused and have more clearly defined targets. What are our strengths and weaknesses? What are the opportunities and the threats? We must determine the kind of society that we are building and the market niches that we are hoping to fill, and plan to achieve these. Political wishful thinking and daydreaming will not make our development sustainable.
- We must recognize our vulnerability and fragility and find solutions to the problems. Possible sea-level rises as a result of global warming, disposal of liquid and nuclear wastes in our sub-region, scarcity of water resources, deforestation, desertification, species depletion, habitat destruction and human despair will all affect our sub-region in ways that could be disastrous.
- Our governments need to upgrade, uphold and uplift the role of science and technology in national planning, decision-making and socio-economic development. This is the way we can keep our scarce resources at home.
- We need to establish a common position on international issues that impact on our sub-region. Too often in the recent past narrow, selfish interests have conspired to militate against regional progress. The establishment of common positions must be the result of informed analysis from the perspective of the region as a whole.
- We must resist the temptation to accept external funding for

projects of questionable merit and impact. Our resources are too scarce to permit this.

- We need to address our resources and make an effort to study our environment, including our seas, to collect basic data and to characterize the world around us. We know too little about the Caribbean environment.
- We must build up and maintain informal and formal networks among scientists and technologists so that we can share knowledge, experiences and projects.
- Scientists and technologists must make an effort to "democratize" science and technology. It is only when we make science and technology intelligible to the man in the street that we can expect to win democratic support for our work and bring the impact of science and technology to bear on the corridors of power.
- We in the sub-region are of the same ilk and in the same boat. We share this Caribbean boat with others who are similarly exposed. I refer to Cuba, Haiti, Dominican Republic, Puerto Rico, the Netherlands Antilles, the Virgin Islands and the French Antilles. We must collaborate and co-operate at a more profound and functional level—at a level that will help us to overcome the limitations of size and resource constraints. There is a clear case here for South-South co-operation within the Caribbean. Collectively we are a threatened species that can survive only with concerted action. In particular, we need to strengthen our regional institutions, including the Caribbean Council for Science and Technology, which transcends the CARICOM Region, so that they serve us effectively.

We must recognize that prosperity and sustainable development in our sub-region has to be created—it will not be inherited. Too often in the past, world events have simply pulled us along. If we are to create this prosperity and sustainable development, there will have to be innovation and imagination. I use innovation in the broadest sense that includes new ways of doing things, new ways of management, new ways of finding and using information, and new R&D. For innovation to be rigorous in this sense, it must involve an investment in skill and knowledge. In the final analysis, our capacity to survive, to sustain this Caribbean region that we love and to bequeath it to our children, will depend on the only real resource that we have—our people.

VI. CONCLUSIONS

The view that resources in terms of energy and minerals, are limited is, in my opinion, a myopic one since it is technology that makes

resources, and technology is always changing. What was a resource yesterday may not be one tomorrow, and what was not a resource yesterday may become one today. Technological change is non-linear and stochastic. Thus, it is unpredictable. Also, a vision of future society based on the limitations of the present could lead us to assumptions that are invalid. Analyzing the past when making projections for the future should not be done on the basis of existing technological possibilities. A. Rahman argued this point in his paper, *Science and Technology in Post-Independence Era: Future Perspectives* (1984).

In the Caribbean sub-region, the impact of external influences and, in particular, technology has been a crucial element in our socio-economic evolution. To a large extent, we have been bystanders to the process. As a result, the basis for sustainable development has not taken root. If this is to happen—and it must to ensure the survival of our fragile and susceptible environment—we must become more and more involved. In this respect, two elements of science and technology stand out. One is exceptional emphasis on human resource development at every level. The other is collaboration and co-operation not only among CARICOM countries, but also with other countries of the Caribbean area.

In his 1985 *Notes on Nuclear Security, Disarmament and Security and the Sharing of International Resources*, Abdus Salam says:

> "The truth is that mankind is already engaged in the 'Third World War'—the war against our heritage of resources—against life on Planet Earth. And we are winning it."

ARE WE GOING TO ALLOW THIS TO HAPPEN?

Labour and Sustainable Development

Trevor Munroe

I. INTRODUCTION

Focus on the Public Policy Implications of Sustainable Development in the Caribbean comes at a time of great challenge for workers, for the trade unions and for industrial relations systems in the region. The challenge arises out of important changes in the labour force—its social character, economic situation and, probably as well, its psychological attitudes. A significant adjunct of these changes—largely brought on by International Monetary Fund (IMF) conditionalities and structural adjustment programs—is the dominating need for immediate survival. As such, the relationship, behaviour patterns and attitudes of labour at the micro and macro levels are unlikely to be focused on development, sustainable or otherwise.

They are concerned with reducing the daily erosion of the quality of life, alleviating frustration and preserving some hope for the future. To cope with these realities in the context of the contemporary global situation, trade unions and the labour movement as a whole must significantly restructure and re-orient themselves. Equally, the workers and labour are likely to remain outside the issues of sustainable development unless the policies and mechanisms that are developed encompass their concerns.

These considerations imply a need for new approaches to worker education, employee-involvement programs, contract bargaining, incentive schemes, fiscal policy, non-unionized segments of the labour force and, most of all, to the IMF and World Bank structural adjustment programs that will have to be devised by labour, the private sector and governments.

II. THE LABOUR FORCE

In the last decades, major shifts have taken shape in the character of the labour force. The more important of these are:

- rapid growth of an "informal sector," particularly in urban areas;
- spread of low-wage employment, particularly of female labour, in Export-Processing Zones (EPZs);
- significant expansion of white-collar employment relative to blue-collar production work;
- emigration of skilled manpower at annual rates often in excess of training institutions' output;
- fuller integration of women into the work force in conditions of structural disadvantage, subordination and low pay relative to men.

By and large, these features are not unlike similar developments in other regions of the Third World. They arise, in general, out of important changes in the international, capitalist system. For example, the prolonged downturn in the world economy rate of growth has negatively affected the Caribbean region's rate of growth. The increased internationalization of capital and socialization of production have contributed to the development of cheap labour EPZs. The lack of dynamism, and, in some instances, the contraction in traditional wage labour, the demand for goods and services from micro-enterprises, and the capacity for entrepreneurial initiatives to exploit these opportunities have combined to encourage a veritable explosion of economic activity in the informal sector.

These and other structural changes are having a marked effect on the typical Caribbean worker. Increasingly, he or she is the cane cutter in the fields, the waitress in the hotels, the machine operator in the mines, and the clerk in the government ministry. More and more, the typical worker is, at least partially, a higgler (or Informal Commercial Importer), a craft vendor, a sidewalk garage-man, a cutter in a Free Zone factory, a "pan-chicken" or "jerk-pork" seller, a security guard, and a short-term emigrant to Canada or to the United States. One implication of this is the extent to which the trade unions retain their traditional, exclusive focus on relatively high concentrations of stable wage labour. In doing so, they are likely to ignore, and to be ignored by, increasingly significant numbers of the labour force.

Yet, relative impoverishment is the prospect of wage labourers and the more traditional, better off, unionized sections of workers. Rigid wage guidelines, high interest rates, exorbitant rents and mortgages, rising prices in basic necessities and drastically reduced

and deteriorating educational, health and transportation services are the everyday experience of a majority of the population because of IMF programs of structural adjustment and the increasingly onerous debt burden. At the same time, the owners, managers and agents of big capital in banks, insurance companies, financial institutions, major commercial houses and export industries accumulate more wealth and consume more conspicuously and luxuriously than ever before. This increasing inequality often aggravates class and inter-racial tensions and promotes sexism.

In these circumstances, worker morale declines, motivation falls, productivity drops, social resentment grows, the drug culture develops, corruption flourishes, and moral codes and inter-personal relations suffer.

III. SUSTAINABLE DEVELOPMENT

The Implications

Clearly, if increasing numbers of people do not know where their next meal is coming from, or whether they will be able to pay the rent next month, exhortation policies alone are not likely to arouse interest in whether the forests are being rapidly depleted to the harm of the next generation, or in developing a culture consistent with environmental conservation. Living from hand to mouth here and now is hardly conducive to making further sacrifices of any kind—especially to ensure that development, which is in any event not taking place, may be sustained for generations to come. In an immediate and strategic sense, alleviating poverty and deprivation, and improving the harsh living conditions of the majority of the population are policy imperatives and social preconditions to sustainable development.

From the standpoint of labour, a prime policy implication of enhanced sustainable development is the easing of pressure on today's unsustainable existence. This means, in effect, that the environmentalist has as much interest as the trade unionist in seeking urgent and rational solutions to Third World indebtedness and to IMF rigidities.

Certainly, debt rescheduling could hardly be counted among these approaches. Perhaps this is the clearest example of sacrificing future generations on the altar of immediate expediency. It would be more relevant to put together an effective coalition—at the national, regional and international levels—around meaningful debt forgiveness, flexible wage guidelines linked to productivity, comparability and profitability criteria, differential interest rate regimes geared to expand net export earnings, and a fiscal policy aimed at encouraging

re-investment of surpluses in order to increase production and employment. Dialogue and, ultimately, campaigns around alternative approaches are certainly implications of sustainable development.

Such campaigns need to recognize, however, that the survival imperative of current conditions has affected the psychology of Caribbean working people. Their sense of community is being eroded by the move toward individual solutions—not least through the acquisition of the 'visa' credit card. Of course, the other side of this coin, which should not be lost on us, is a continued North Americanization, even internationalization, of Caribbean people—with the positives and negatives entailed therein. Greater tolerance—even emulation—of corruption is overtaking admiration of integrity. There is a growing aggressiveness as opposed to considerateness, force and factionalism as opposed to discussion and compromise in settling differences at all levels—personal, political and industrial. Calculations of immediate short-term gain dominate long-term considerations.

In this respect, let us take a concrete example. On almost every cane farm in the Commonwealth Caribbean, cane is burnt for cutting during crop. All interests—certainly factory management, cane farmers and, to a lesser extent, cane cutters—are aware this practice is very often harmful to soil quality and to sucrose content in the medium and long term, as well as being an obvious air pollutant. In this case, ignorance is not a problem. There is definite awareness that burning cane contributes to unsustainable development in the sugar industry, yet all parties involved co-operate to continue its practice. The reason is clear: cutting green cane is a more difficult and time-consuming operation. The rates set by the industry make it more immediately beneficial to cut burnt cane rather than green cane. By implication, the worker has an immediate material interest in unsustainable development. This problem can hardly be overcome by greater public awareness, higher levels of worker education, or by more persuasive exhortation. The rate for cutting green cane needs to be so much higher than for cutting burnt cane that an immediate material interest is taken in sustainable development. This example poses a question central to the issue: is the enterprise, the industry, the nation, the global economy willing to invest sufficient resources to open working people and whole populations to developing a material and moral interest in sustainable development? Hitherto, the answer would have been a resounding no.

Possible Solutions

Enhanced Worker Awareness

Parallel and coordinated action by policy-makers inside and outside the labour movement are needed on a number of fronts to reverse this situation. In the first place, public awareness and consciousness of the dangers of unsustainable development need to be sharpened within the working classes. There is no shortage of academic analysis, scholarly material and policy recommendations available to regional governments. However, their effective and comprehensive transformation into meaningful public education has been lacking. Consequently, the environmental consciousness of labour and capital suffers. To correct this deficiency and to effectively target these strategic groups will require non-traditional methods. The community of non-governmental organizations—primarily those representing labour and capital—will have to receive and release substantial resources earmarked for environmental education if anything meaningful is to be achieved. In both designing and implementing such programs, worker educational bodies—national trade union centers, individual labour unions, the UWI's Trade Union Education Institute (TUEI)—will have to be fully involved. As I have implied earlier, however, worker education, while necessary, is hardly likely to be sufficient.

The Team Approach at the Workplace

In the increasingly private-sector led economies of the Caribbean, private centers of decision-making power have major responsibility for determining the quality of development that takes place. Bauxite-alumina and mining multinationals, sugar and coffee plantation owners, hotel and tourist interests, large manufacturers on urban industrial estates, and housing developers are among private-sector entities most immediately involved. Within these firms, the discretionary power of capital to use and, in many instances, abuse the human and natural environment alike has been considerable. Among other things, this has contributed to increasing worker alienation and decreasing employee motivation in the context of wage guidelines and other IMF-dictated constraints on worker satisfaction. Adversarial responses by unions following management decision-making is understandable, even mandatory, but is often counterproductive. Employee involvement in full and effective power sharing at the workplace is a more enlightened approach and will impact on the changing contemporary economic environment. Both labour and management will be challenged to replace traditional

authoritarian-adversarial relations with the team approach espoused by modern management theory. Decisions by management at the plant and enterprise level, which wastefully utilize non-renewable energy or damage the environment without regard to long-term implications, have to give way to decision-making that includes labour as a joint partner, hopefully with an increased consciousness of ecological factors.

This, of course, has implications for contract bargaining. Naturally, this process needs to retain its concern for wages, fringe benefits, working conditions and worker rights. The changed situation, however, challenges labour and management alike to adopt a problem-solving approach to issues, and to move away from the position where each side seeks to defeat the other. The environmental consequences of a given production process is an obvious area for continuing attention and joint problem-solving during collective bargaining. National, industrial relations norms and codes in the region, drawn up primarily by governments, could well be modified to reflect this concern.

Worker Incentive Schemes

Another area of implied action in orienting toward sustainable development is that of appropriately and jointly devised incentive schemes for labour. The production worker is well placed to suggest ways of reducing the energy content, raw-material use and environment consumption of each unit of production. This expertise is lost, more often than not, to the production process because of traditional disregard of the worker as a mindless factor of production. Management and owner interests, which relate to workers as "hewers of wood and drawers of water," need to adopt a new approach if creativity and initiative in the labour force is to be harnessed to the requirements of sustainable development. The psychology of partnership needs to replace that of superordination and subordination. In this context meaningful and mutually beneficial incentive schemes become feasible. Experience suggests that such schemes can be effective when incentive norms and criteria are clearly spelt out and widely disseminated in the enterprise. Cash reward and material compensation need to be realistic, attainable and directly proportional to the magnitude of the environmental cost/saving that results from the employee suggestion. Labour should seek to make such schemes a subject of collective bargaining and to incorporate appropriate clauses in Collective Agreements. This should be encouraged by the state.

A Strengthened Labour Lobby

To coincide with such approaches at the enterprise level, the labour movement needs to become a more effective lobby at the governmental level for appropriate policy. For instance, fiscal measures are needed to encourage expenditure—investment, maintenance and otherwise—on technologies and processes oriented toward natural resource conservation. Tax allowances of this kind also need to be considered for allocations by private sector interests toward research and development of environmentally appropriate technology. At present, and in the period since Independence, these expenditures are extremely small. Another fiscal implication of sustainable development at the national level, which must be of interest to a labour lobby, is the relatively insignificant allocations made in the Budget to environmental agencies. Numerous authorities, committees, divisions and commissions share responsibility for administering the many relevant laws and regulations. However, they are—as is the case elsewhere, and in the First World as well—inadequately funded and poorly staffed.

Changes Needed in IMF Methodology

This resurrects the issue of the continuing inflexibility of IMF and World Bank structural adjustment programs that affect fiscal expenditure and other conditionalities. The Caribbean labour movement, alongside working class movements throughout the Third World—indeed popularly based governments themselves—have a vested interest in lobbying for fundamental change in IMF methodology. Not only do the current programs not facilitate sustainable development, they encourage unsustainable retrogression. This is now widely accepted not only in the South, but in the North as well. As Jim MacNeill stated:

> "The strict conditionality imposed by the World Bank and the IMF has often appeared to take little account of the social and other consequences of the economic and fiscal measures required . . . of their potential impact on the environment and ecological resources of the country concerned. Measures to reduce budgetary deficits often have a disproportionate impact on such resources."

The issue, therefore, is no longer primarily recognition of the deleterious effects of IMF conditionality. The problem now is mainly one of strategy and tactics, of developing the process and forms of modified conditionality and mobilizing it on a broad scale for acceptance and implementation.

In this context, it is imperative that the international, regional and national labour movements play a central role alongside environmental agencies and interests of all types. At the national level, labour can no longer be content with a marginal role, or no involvement at all, before and during negotiations with the IMF and similar international financial institutions. The trade unions must move to the center of such processes. For this move to be effective, other changes are required urgently: qualitative upgrading of the research and technical capability of the labour movement; greater national unity and coordination; a new level of linkage and mutual solidarity with international organizations interested in labour matters and environmental issues.

Social Unionism to Complement Economic and Political Unionism

At the local level, the labour movement needs to be less parochial if it is to (and is seen to) champion genuinely human interests, and not only its own constituency. Trade unions need to address the survival concerns of the disadvantaged, who are among its traditional membership. Housing, sanitation, recreation, education and concerns of shanty-towns surrounding major unionized enterprises are prime areas for attention. Good corporate citizenship now requires companies to pay attention to community rehabilitation and upgrading. Trade unions may well assist in this process, and at the same time overcome their tendency to sectarianism by including the needs of depressed satellite communities in union claims. These could include proposals for contracts to provide certain goods and services to enterprises (e.g., food, transport, protective clothing) to be channelled into the informal economy. Naturally, competitiveness, quality and standards would have to be maintained. If, as is being argued, the informal economy is likely to be a more or less permanent and dynamic source of production and employment rather than a stagnant pool of dropout labour, there is every reason for this approach to succeed. Networking and interlinking with other civic bodies—churches, youth clubs, citizens' associations—would naturally follow on this method.

I am, in fact, arguing for a social unionism to complement the economic and political unionism that has historically characterized Caribbean labour. Anything less is likely to reduce the ability of labour to cope with current changes in the economic and social structure. The unions will, in fact, run the danger of speaking on behalf of a minority group among the majority classes. The labour lobby on environmental issues and other matters will to that extent be weakened. This need not be so if the unions respond in creative

ways to the challenge of social unionism. In this sense, tripartism takes on new meaning and an additional dimension. The trade union component, alongside government and business, then begins to speak not only for wage labour but for other parts of an increasingly segmented labour force.

Human Resources Development Public Awareness/Participation Policies and Practices

Peggy Antrobus

I. INTRODUCTION

In this presentation on public awareness and participation I want to start by raising three questions: What are the issues of which the public should be aware? Who defines these? What type/level of participation are we talking about? If we can answer these questions, we are then in a position to identify policies and to discuss practices.

II. THE ISSUES

The starting point for a discussion of the issues must be an examination of the conceptual framework within which the environmental crisis and sustainable development is being addressed. In a sense, this framework is an expression of the problem itself. For example, our use of terms such as "human resources" and "sustainable development" reflects a world view in which human beings and nature are objectified. The values of wealth and commodity accumulation, which underlie this world view, have shaped our approach to people and to nature as resources for the marketplace.

The developmental model that emerges from this world view is one that produces extremes of affluence and poverty—in the economies of the South more wealth trickles out than trickles down—and both affluence and poverty are determinants of environmental degradation. It is also worth noting that the damage to the environment caused by poverty is nothing compared to the damage caused by the pursuit of affluence. Macroeconomic policies that foster these extremes cannot lead to sustainable development.

Nor can they mobilize public support for conservation and environmental practices that are more respectful of our natural environment.

Because this world view has prevailed unchallenged, the global community is now faced with a multitude of problems—acid rain, global warming, rising sea levels, rising cancer in human populations, desertification, famine, "environmental degradation," the death of the earth.

But the challenge to this world view is beginning. Late last year members of a network of NGOs from the Philippines, on a mission to the U.S.A. to promote a vision of sustainable development to be achieved through global co-operation, pointed out that "Up to today, development strategy suffers from the same world view that produced the problem" and challenged the idea that "private enterprise, given free rein, in a playing field cleared of obstacles interposed by monopolies and inappropriate government interventions, with appropriate incentives and with government concentrating on building infrastructure, enforcing the laws suppressing insurgency by military action, will by itself promote the economically and socially desired ventures, ensure equitable distribution of livelihood, and balanced exploitation with conservation of natural resources."

They point out that the intensifying crisis has brought about ". . . a heightened awareness among the population that somehow or other the roots of their problems are embedded in the very structure of the social and economic system and are inherent in a strategy of development that preserves and protects this inequitable structure . . . [and that] . . . there is a widespread belief that there are alternative developmental models that directly address their poverty and provide growth and development consistent with an equitable sharing of the burdens and fruits of progress." (*Creating a Common Future: Philippine NGO Institutes for Sustainable Development*, 1989)

This call for global co-operation sums up the views of an expanding network of NGOs calling for alternative approaches to development. At the cutting edge, these include Third World women—long the most silent majority—proposing Development Alternatives with Women for a New Era (DAWN). DAWN—a network of women researchers, policy-makers, communicators and activists—has challenged this model, recognizing the special jeopardy in which it places the sources of livelihood of poor women, and the lives of their children. Sen and Grown, in their publication, *Development, Crises and Alternative Visions* (1987), for the DAWN network, comment on what they describe as a "generalized reproduction crisis" in the provision of basic needs, points to the linkages between the lack of integrated policies toward farming, timber use, and water management, and the environmental and

demographic processes that are themselves the result of short-sighted policies and existing power structures. They call for alternative approaches to development that would focus on the needs, perspectives and concerns of poor women.

III. THE CONSTITUENCIES

The starting point for discussing the second question—who defines the issues?—must therefore be recognition of the different voices engaged in this debate, the different constituencies, interests and stakeholders. We can distinguish these according to location: international, regional and local.

These constituencies have conflicting interests and viewpoints that are not being recognized—and this is the problem. Who are these constituencies? The following classification is undoubtedly open to debate, but I have chosen to identify them primarily to call attention to the absence of some major constituencies from this meeting. For the purposes of this presentation I have identified the following:

- *The mainstream environmentalists.* Policy-makers and international NGOs—those concerned with, as Gro Harlem Brundtland states, how to ensure "growth that is forceful and at the same time socially and environmentally sustainable." (*Our Common Future*, 1987). But governments in the North and those in the South have different perspectives. In the North, concerns focus on pollution and climatic change. In the South, while recognizing the seriousness of negative global, environmental trends, governments are also concerned about how these trends, and the alarm they are creating in the North, have a negative impact on their countries' productive capacity. The international NGOs include those concerned with the relationship between humans and nature—e.g., greenhouse warming, the loss of tropical forests and biodiversity, etc.—and focus attention on raising public awareness of these issues.
- *Professional environmentalists.* These work within international agencies such as the United Nations and the World Bank, governmental, environmental units, and with the international NGOs. They are the technical experts on environmental impact, and on systems for monitoring the effects of development on the environment. This impetus for this Conference comes from this and the previous category.
- *Population control groups.* These groups are concerned with the negative impact on the quality of life that results from

over-population on a limited resource base, and focus on women and the poor as the villains of their Malthusian nightmare.

- *"Deep" ecologists.* This category broadly includes people who share a philosophy that embraces the primacy of the natural world.
- *Tribal peoples.* At the peripheries of colonial expansion there are always the tribal peoples. They are concerned about threats to a livelihood based on a symbiotic relationship with the land, and they focus their attention on preserving land rights.
- *Local communities.* People in urban and rural communities whose health is affected by industrial waste, or whose quality of life and livelihood is threatened by certain types of development; e.g., tourism, bauxite mining, etc.

But there is another constituency—powerful, pervasive and present, though seldom named in these forums—with which, in some way or another, the above categories are all related. It is the financial interests underlying the global economic system. This system is at the center of the structures that dominate and exploit humans and nature: it defines political, social and cultural realities. And it is within this analytical framework that the lines of alliance and resistance emerge.

In this framework, the issues are, in fact, being defined by those with the resources, power and political clout that assures them access to the media, to policy-makers, and to the multilateral and bilateral agencies that are concerned about environmental issues (for whatever reason). In short, the issues are currently being defined from the North, and those of us in the South—those who set up environmental projects, attend these conferences, and generally take part in the emerging debate—seem to be merely reacting to that agenda.

Fortunately, this trend is being reversed, and the focus of this conference shows that Caribbean people are beginning to define and analyze the issues of the environment and sustainable development from our own perspective. But it is only a beginning: even here the focus is primarily technical, nowhere on this agenda is there space for the perspectives of the people whose lives are most affected by the negative consequences of the unsustainable development practices that Caribbean governments and peoples have pursued in efforts to develop our countries—the practices that have led to the environmental pollution that is now so evident in the harbours, cities and mining districts of Jamaica.

So, I am delighted to see that at this conference we are addressing issues that are emerging from our own experience of the environment: issues related to our fragile ecological systems; to

climate changes; urbanization; the potential negative impact of tourism on our culture, society and economy; our vulnerability to natural disasters—a vulnerability that stems from the fact that our economies are open, dependent and poor, and are located within close proximity to a country that is the self-appointed World Champion of the very economic system that has caused such havoc to the global environment.

In fact, it is only on the basis of this type of analysis that we can usefully, and meaningfully, discuss the type and level of participation Caribbean populations can have in the environmental debate.

IV. PARTICIPATION

The level and type of participation is determined by the interests of these constituencies mentioned earlier, and the degree to which their interests are allied with or opposed to those of the economic system. Environmentalists have now created an industry and, therefore, have a professional interest in these matters. "Deep" ecologists participate on the basis of their abiding concern about the planet. Tribal and local communities are fighting for their very survival. It is worth noting that these groups respond not because of any public education program, but as a result of financial and economic imperatives and the deterioration of their life base. And within all of these constituencies there are women articulating their own perspectives, which are based on a deep concern for the protection of their sources of livelihood, and the quality of life for their children and the future. They know that you cannot be "fair to the future" if you are not fair to the majority of the present populations.

These concerns have already led to the formation of grassroots movements in many parts of the world—from a small community in St. Lucia protecting the mangrove swamps, to Greenpeace; from the Chipko Movements in Kenya and India that strive to protect a relationship between the forests, their livelihood and themselves, to the DAWN network, which is beginning to formulate a project through which Third World women will redefine the issues of environment and sustainable development to reflect our specific concerns and vision.

V. POLICY

Finally, we come to the question of policy: what must governments do? Bearing in mind that governments must concede to the imperatives of the global economic system, we must start by

recognizing that when the interests of constituencies are allied to those of the economic system they find support at the policy level; but when they threaten this system, they are ignored or suppressed. Thus, when a group seeks to protect a natural habitat (e.g., St. Lucia's mangrove swamps), their efforts are applauded, but when this same population seeks to resist the sale of their national symbol in the interest of tourism, they are disparaged. Again, yesterday, we heard from Belize about the reality of political pressures to approve projects that are environmentally unsound, and of the double standard that exists between private and public-sector investments in relation to EIAs.

The assumption that Third World governments are autonomous, and that they are accountable to their electorates, limits the analysis of groups such as the Brundtland Commission and prevents the formulation of effective strategies. The same fundamental flaw occurred in the analyses of the Brandt Commission (*Programme for Survival, Common Crisis*), and the Palme Commission (*Common Security*). In each case the analysis of problems and solutions was formulated within a framework of technical constructions that denied the political realities of the North-South imbalance that is embedded in the global economic system. An effective strategy for public awareness and participation must start with the recognition of this reality—within countries, no less than between countries.

In this region of coastal zones and increasing danger from natural disasters—hurricanes, floods and volcanos—policies should reflect the specific character and reality of these ecosystems, as well as the need for providing adequate livelihoods for Caribbean peoples. Our attention must be focused on protecting our fragile environments from the most devastating consequences of rampant industrialization—dumping of industrial waste from the North, a tourism product driven by the need to earn hard currencies, rapid urbanization resulting from the inadequacies of rural development, and the intrusion of a drug culture and prostitution that is emerging in response to a deteriorating economic base. Above all, those of us who live in the hurricane-prone areas must shape all of our efforts—in agriculture and health, in community and rural development—to take account of this reality. The context for our work must be preparation for disasters. In short, policies must be based on the peculiar realities and concerns of Caribbean electorates.

In this connection, I want to draw special attention to the suggestion of Dr. Naresh Singh that, in this region, sustainable development should be "based on a philosophy of living off the interest accruing from, without permanent depletion of, our capital stock of natural resources." It is in this way that we will be able to focus public attention on the issues of livelihoods and not on global issues, except insofar as they affect us. And in relation to the global

issues of climate change, our governments should focus on co-operating with international agencies that address these concerns, not on spending our own scarce resources on studies and technologies to monitor them. Rather, they should be allocating resources to preparing Caribbean populations to deal with the consequences of phenomena over which they have no control.

Recognizing the powerful financial interests and developmental imperatives that constrain the actions of Third World governments, and that it is the governments of the industrialized countries who must ultimately introduce policies aimed at controlling those practices that endanger the planet, our governments must build alliances with international NGOs and environmentalists, rather than with the multilateral institutions that operate to protect the interests of international capital and world trade. Here Clive Thomas's list of do's and don'ts is pertinent: the rejection of

- "[economic] policies that are not founded on the prior determination of the sustainable limits of natural resource exploitation;"
- "laisser faire approaches to natural resource use within the region;" and
- "policy frames that do not explicitly recognize the continuous interaction between the human and natural environmental dimensions of development."

However, in order to ensure that the concerns of Caribbean electorates are heard, together with those of Northern constituencies, our governments must first explore these concerns with the people who are being affected. This means that our environmental movement must not only be fuelled from the top with sound, technical information on such matters as potential climate change and inappropriate "mal-development," but must be fed from the community with the concerns of ordinary people for a safe and healthy environment. In fact, the movement cannot depend on highly trained people either: without the active participation of the population, even the best efforts at building awareness fail at the action level.

In this regard, women—especially poor women—must be recognized as key actors since, in meeting the basic needs of people, theirs is the strongest relationship to food production and distribution, water and sanitation, and to health and education. Most important of all, as the chief agents of socialization, women are in a position to encourage those attitudes and practices that go toward building respect for our natural habitats.

Governments must, therefore, welcome and encourage NGO and community-based interest in, and initiatives on, environmental issues,

and not see them as nuisances (or blocks to their developmental initiatives), as if the purpose of development was to produce profits. In short, governments must resist what others have referred to as the "tyranny of GNP" and align themselves firmly with the interests of a majority of their electorates, if they are to achieve a model of development that is "fair to the present."

It is on this basis that governments can build coalitions and alliances with other Third World governments, whose constituencies are expressing similar concerns. It is on this basis that they can form joint (South) alliances with constituencies in the North with which they have common cause. It is this type of awareness, these types of coalitions and alliances, that can stimulate a broader public awareness of the links between poverty, inequality and environmental degradation, and that can create effective strategies for public participation.

But we must also beware of the tendency to concentrate on studies, conferences and resolutions, with little follow-up action. Indeed, these often become excuses for inaction.

Finally, we must be careful that we are not attempting to apply improved technical solutions to a situation created by the very use of science and technology for rapid economic growth and industrialization in the first place! In their efforts to acquire the best technical assistance in this area, governments must be aware of the limitations of purely technical approaches to development: the participation of Caribbean peoples in identifying problems and choosing the technologies to deal with them is essential. Indeed, in our search for technical solutions, we should not overlook the fact that ordinary people often have a great deal of knowledge about their own environment. Technicians must learn how to elicit this. The attitudes and skills required to do so must be part of the training curriculum for resource managers.

VI. CONCLUSION

In summary, I have been recommending that Caribbean governments focus on issues of particular concern to Caribbean peoples, and that they should build their own power base by encouraging and supporting the interest and initiative of NGOs and community-based groups—especially those that take account of women's specific perspectives. They should align themselves firmly with the interests of the majority of their electorates, instead of with the financial interests of the few. Without recognizing the differences between the interests of various constituencies in this new arena of sustainable development and environment, public awareness programs will lack credibility, and public participation will be limited to coercive

measures that are aimed at controlling people's struggle for survival, rather than the anti-social technologies of rampant industrialization and unregulated economic growth.

PART III

The Transition to Sustainable Development

Part III — The Transition to Sustainable Development

Introduction

The Caribbean region and its inhabitants are living through a totally new situation with challenges and opportunities unmatched in human experience. The realities of this new world have not yet been reflected in human behaviour, science, economics, institutions of government or international institutions. The challenge is to encourage transition to more sustainable forms of development as rapidly as possible.

Throughout the Conference, speakers and participants who intervened acknowledged that current forms and approaches to development cannot continue without leading to further environmental degradation. The extent of this concern was reflected in the constant calls for action—in the Caribbean, in other developing world regions, and in industrially advanced countries—to devise and put in place alternative forms of development that meet the needs and aspirations of an expanding population without destroying the natural environment.

But what kind of action? While a specific strategy for action was neither formally debated nor recommended by the Conference, several elements essential to the articulation of a sustainable development strategy for the Caribbean did emerge.

Redefining Development from a Caribbean Perspective

The need for countries, individually and collectively, to redefine economic development in terms that will preserve and enhance the

natural resource base of the Caribbean was viewed as absolutely essential if the region is to avoid environmental disaster. That this will, of necessity, involve challenging many current development concepts should not be used as an excuse for delaying the urgency with which this task is undertaken nationally and regionally. Short-term pilot projects aimed at improved natural resources management, as useful and important as these are, similarly should not be used as an excuse for deferring the definitional task. Nor should there be any illusion that there is an easy solution to this task, such as expanding the non-tourism service sector, which is relatively neutral environmentally, as a possible panacea. As William Demas, Governor of the Bank of Trinidad and Tobago noted in his introductory comments to the closing plenary,

> "[The non-tourism service sector] is not a bad idea but I think it is somewhat utopian in that the constraint of the application of these services would be the severe shortage of high technological skills in the Caribbean . . . I do not think we can get around or escape from the [sustainable development] problem by that particular method. . . . It does seem, to me, that increasingly we have to think of some kind of alternative development or, if you wish, far-reaching modifications in lifestyles. As I see the problem, in a rather simplistic way, this is absolutely essential if we are not going to bring disaster, planetary disaster, upon ourselves."

Sustaining the Natural Resource Base

While it was acknowledged that the natural resource base will continue to underpin the developmental prospects of virtually all countries of the Caribbean, there was general consensus that a new type of developmental pattern is required that enhances the ability of the region to live off the interest on its stock of ecological capital instead of running down its stock of natural resources.

The urgency and potential for this is illustrated in the following perspective for countries comprising the Organization of Eastern Caribbean States.

> "During the 1990s the OECS development strategy hinges on tourism development since tourism is to be the main engine of growth, agricultural diversification, and expansion of the manufacturing and service sectors. The important linkages between tourism, agriculture and the environment indicate that the OECS will have to pursue a

sustainable development strategy. There are, however, some storm clouds on the horizon, which indicate that these economies might not be able to sustain the high rates of economic growth they enjoyed during the 1980s. This is due to the possible impact of the *Single European Market Act* of 1992, which is expected to provide a significant external shock to the banana industry that predominates the Windward Islands. This *Act* is, however, expected to impact favourably on tourism.

The economic scenario that emerges is the OECS Member States should reduce their dependence on bananas by means of agricultural diversification and greater diversification of their economic structure. The environmental implications of this scenario are interesting: reduced banana production by concentrating on the most productive areas could reduce environmental degradation caused by forest encroachment and by the extensive use of sprays and pesticides; tourism development, with changes toward more nature-oriented activities, will require improvements in the environment. At the same time, ..owever, tourism development and manufacturing will also pose serious threats to the environment. Thus, there must be some awareness of the positive and negative impacts of development on the environment. These aspects indicate that it is essential to develop an environmental strategy for the OECS as soon as possible." (Carlyle Mitchell)

In devising this new type of development pattern at both the national and regional levels, the need to involve all segments of society—e.g., government at all levels, non-governmental groups, environmentalists, population-control advocates, tribal peoples, organized labour, women, local communities and private entrepreneurs—through new forms of public participation and consultation and much more openness in decision-making was a constant theme throughout all Conference sessions.

Also basic to this redefinition process was the constant call for a series of pilot projects in a number of countries to reforest critical degraded watersheds, halt the spread of soil erosion, and to restore beaches and marine habitats. To demonstrate their commitment to these efforts, it was stressed that governments should provide financial resources of their own and not rely exclusively on financial support from external agencies.

Several participants noted also that many of the sustainability issues confronting coastal and beach areas stem not simply from the resource exploitation practices of the local population but, in many

coastal towns, from the overcrowding generated by an abundance of tourists. In this context, it was suggested that the assessments of the benefits of tourism to economic development should include costs imposed on the natural resource base as well as socio-cultural costs and benefits. The notion that tourism development planners give greater attention to devising measures that would increase the locally retained expenditure per tourist was also strongly advocated. This contrasts with current planning practices, which many believe focus too heavily on increasing the number of tourists. The point was made that, increasingly, tourists are becoming more discriminating in their search for pristine environments. As such, the tourism industry could suffer a major decline if coastal and marine degradation is not arrested and reversed.

Other areas that were frequently highlighted as requiring priority attention for sustaining the natural resource base, possibly through pilot projects, were to:

- devise and test new techniques and mechanisms for blending agricultural and forestry policies to both promote agroforestry and prevent uncontrolled grazing and the expansion of illegal squatting activities;
- devise and test new measures to promote the rational allocation of land and water for competing uses in rural, urban and coastal areas;
- devise and test new measures to reduce the generation of energy and resource wastes in harvesting and production processes—including improved waste recycling and treatment;
- devise and test the economic and social benefits of community-based, small-scale fisheries development and management.

These pilot projects and developmental priorities were considered by many to provide a basic framework and focus for the further development and strengthening of the region's indigenous research and development capacity. Regardless of whether this framework proves to be the most effective, there was a constant call for Caribbean governments, individually and collectively, to develop clearer policies regarding the importation of technology. Particular stress was placed on the need to develop better negotiating abilities and to begin to reject inappropriate technologies, projects and policies offered by donor agencies.

Ameliorating the Extremes of Wealth and Poverty

Without exception, speakers, discussants and intervenors in all Conference sessions stressed that sustainable forms of development

for all segments of society—governments, national and international non-governmental groups, environmentalists, population control advocates, tribal peoples, organized and informal labour, women, youth, local communities and private entrepreneurs—must be underpinned by a primary concern for a respectable quality of life for all people. This not only requires new forms of political participation through public consultations on development plans and environmental impact assessments, but also much more openness both within and between governments. It also places a premium on the development of the region's total human resources and their participation in decisions affecting their lives.

It was noted time and again that unsustainable development stems from the extremes of wealth and poverty, nationally and internationally, generated by the exploitation of both natural resources and the poor. Until the wellbeing of the poor is improved and their dignity enhanced, conserving and rehabilitating the environment will remain a secondary development priority. This is as true for the urban poor as for those who eke out a living from the natural resource base in rural areas.

From this concern for ignorance and poverty, as the root causes for the historical degradation of the environment in the pursuit of economic gain, emerged two criteria that were considered fundamental, if development in the Caribbean is to be realigned and redefined in terms that are fair to both society and the environment. First, is the need for governments, industry and labour to commit themselves to a concentrated focus on poverty and the enfranchisement of the poor as a precondition for sustainable development. Second, is the need to recognize and build upon the genius, wisdom and talents of indigenous societies and communities—and the cultures from which these flow—as preconditions for development and progress.

Among the many implications of the criteria for those responsible for providing leadership in the developmental process, the following received considerable attention and support:

- governments and industry must welcome and encourage communities and non-governmental organizations as valuable and knowledgable resources in the analysis, design, and implementation of development initiatives, including environmental impact assessments;
- labour and management should adopt a joint problem-solving approach that embraces environmental considerations in the process of collective bargaining;
- organized labour should expand its focus beyond its membership to lobby and champion for the interests and survival concerns of women, unorganized labour and the disadvantaged;

- educators and educational institutions—formal, informal and private—should guard against, and even reject, adopting or accepting support for curricula and approaches to education that are incompatible with the developmental needs of the society they are designed to serve;
- scientists should ensure that the focus of their research and technological developments respect and support social and cultural values and are environmentally sound.

Integrating Economic Decision-making and the Environment

If countries in the Caribbean region are to move toward more sustainable forms of development, the need for policies that integrate economic decision-making and the environment into the entire developmental cycle is key. The region can no longer afford uncoordinated policies of economic management on the one hand and natural resources management on the other. This was identified as probably one of the most important and difficult challenges facing governments. As Deputy Prime Minister Patterson noted,

> "There is now an established relationship between the issues of development and the environment. Indeed, the two are intimately interlocked, to the extent that it is not prudent to make decisions concerning one without due consideration of the other. Also, there is growing public awareness about matters concerning the environment, as the media in our region has become more sensitized to its importance.
>
> "The levels of public concern being expressed places additional strains on our respective governments to act decisively and responsibly. . . It is true that technological breakthroughs are providing new departures and opportunities, but the obstacles to the sustainability of which I speak are not only technological. Indeed, they are social, institutional and political.
>
> "It is clear to me that two aspects of this problem must occupy our urgent attention. First, are the technical solutions that are possible and practicable, and, secondly, the policy decisions and shifts in governmental orientation that are deemed necessary to ensure that these solutions can be implemented. Overcoming the known barriers to sustainable development requires vision and courage in

policy and institutional changes on a scale that has not been required before. It is my considered view, that as Caribbean governments and policy-makers, we have a historic responsibility at this stage of our development, to confront the challenges posed with foresight and strength of purpose."

Enhancing the Capacity for National Development

The weaknesses inherent in current approaches to national development were a source of constant concern throughout the Conference. The overlaps in jurisdictional responsibilities between government ministries for policy development and project planning was an overriding concern, particularly the variations in ideologies and priorities among ministries and the confusion and "mixed signals" that this generates for the development process. Jurisdictional overlaps were also seen as a root cause for unproductive duplication of effort and the waste of scarce, skilled personnel and financial resources. This was true for all levels of government. For instance, the need to rationalize the urban institutional framework in most Caribbean countries, so that scarce professional and technical skills may be more effectively used, was highlighted.

From these concerns emerged a general consensus that legislative and administrative mandates must be changed to promote the development of institutions and policies that are truly cross-sectoral and that encourage integrated resource management. These must be given support at the highest political levels to overcome entrenched bureaucratic resistance, with immediate priority being given to comprehensive planning of the total stock of physical and human resources.

In this context, there was strong support for the notion that the environment must become one of the priority items considered by Ministers of Finance and Development Planning along with jobs, productivity improvement, export growth and the like in making fiscal and investment decisions. On several occasions, it was stressed that, where they exist, Town and Country Planning Departments must be actively involved in comprehensive planning rather than being restricted to a strictly development, control function. Both research and development and human resource development policies should also be structured to concentrate on this integrated approach to environment and economics.

It was recognized that integrating environment and natural resource considerations into the economic decision-making process will require the development of new tools and techniques for economic

analysis and planning. Among those identified, the following areas were highlighted for priority action:

- the comprehensive re-examination of fiscal policies, in order to eliminate those incentives and subsidies that are presently contributing to the unsustainable exploitation of the natural resource base;
- the application of environmental impact assessments to all major public and private-sector investment projects—these EIAs would be published and discussed with all parties who would be affected by the project;
- the development of economic policy frameworks that explicitly recognize the relationships between the human and natural environments;
- the incorporation of the value of natural resources into the national accounts of at least some countries;
- the development of better data and planning techniques to ensure the integration of sustainable development into the developmental cycle;
- the development of new techniques for cost/benefit analysis that explicitly recognize the need to eliminate the present reliance on discount rates that systematically discount the future and penalize generations yet to come.

Strengthening the Capacity for Regional Integration

The geography of the Caribbean and the nature of the environmental hazards are such that any strategy for sustainable development must cut across the linguistic, cultural, political and other artificial barriers and encompass all countries of the region. This was an overriding challenge that was highlighted throughout the Conference and resulted in several suggestions for systematically strengthening the capacity and framework of regional institutions. Potential shifts in long-standing export markets and trading arrangements for Caribbean produce and products, particularly those shifts resulting from the new international trading arrangements of the European Economic Community, were also considered to demand a strong regional response. Also, new international relationships are emerging from an environmental perspective, which the Caribbean should consider from a regional perspective. As Jamaica's Deputy Prime Minister Patterson put it,

"International environmental issues are shaping economic relationships between the wealthy, industrialized countries of the North and the developing countries of the South. In time, the environment can become a medium for the transfer of resources to developing countries. The process is being propelled by:

- the growing acknowledgement by industrialized countries that, unless there is international co-operation, the effects of global environmental problems will be severe on all countries;
- the opportunity afforded developing countries to justifiably link environmental issues to the international debt burden, which is a major obstacle to their ability to finance national, environmental management programs.

"Environmental factors may validly be defined as important or essential aspects of almost any of a developing country's productive or social sectors. This means that there is considerable latitude in framing environmental projects for presentation to donors. . . . During 1990-91 there will probably be more than US$ 1 billion readily available for environmental work, including projects related to global warming and climate change. The international community is moving toward special, international mechanisms for global environmental funding. By 1993, there could be a global environmental fund as the main international mechanism for channelling environmental funds to developing countries.

"Here in Jamaica, we have decided to allocate part of the Lomé IV funds to environmental projects. Caribbean governments would be well advised to adopt a similar position so that, together, the region may launch a major assault on the various environmental problems that confront us."

Many participants echoed the need for a regional position to be developed on climate and global change. Despite the region's minor contribution to the causes of global warming, its impact will affect the Caribbean very seriously. These causes are now the subject of a series of international meetings and consultations leading to the World Climate Conference in November 1990 and the United Nations Conference on Environment and Development in Brazil in 1992. The Caribbean must play a strong and united part in these discussions, which should aim both to limit the effects of climate change and to

provide assistance to developing countries to move to more sustainable forms of energy use. The 1992 Conference should also be seen as an opportunity for countries of the region to collectively press for both new international, financial arrangements and changes to structural and sectoral adjustment lending in ways that will be more supportive of environmentally and ecologically sustainable objectives.

Among the preliminary steps that were recommended to strengthen the capacity of regional institutions to address such global issues, was the need for political commitment and support for strategic planning throughout the region. This was seen as a potentially effective means of systematically rationalizing institutional structures at both national and regional levels through the pooling of data and specialist resources. This might ultimately lead to the development of a regional strategy for sustainable development. As Carlyle Mitchell noted,

> "Developing an environmental strategy for the OECS region requires a multi-disciplinary and highly integrated approach, since it is obvious that environmental concerns transcend many disciplines, such as biology, economics, engineering, land-use planning and others. Some of these disciplines might not be readily available on an island-by-island basis. Thus, the formulation of a strategy might best be accomplished on a regional basis. . . ."

The need for a new regional institution focusing on the environment and sustainable development was not felt to be a priority. Rather, existing institutions should be strengthened, building upon what has already been established. It was considered that there is room for changing the scope and focus of existing institutions through maintaining flexibility in design and function. For example, it was suggested that CARICOM, suitably strengthened, could satisfy the need for a regional, institutional forum and ultimately provide the leadership necessary to tie together economic and environmental policy throughout the region. This forum could also be the focus for governments of the region to harmonize their norms and standards for waste management, environmental impact assessment and the like so as to prevent both the growth of "pollution havens" and investors from playing one country off against another.

The need for regionally-based advisory services on water, wastes, energy, and agricultural chemicals was often highlighted. Particular stress was placed on the need to assemble information and appropriate data that would better support both the identification of available options and informed decision-making regarding resource development and management. In this context, it

was suggested attention be given to the sharing of materials that are available in a large number of studies and reports, but which have not been made available for general distribution. It was also suggested that a water resources management information system be developed as a management tool that would provide a database for use in implementing an early warning system, investment planning and management.

Two other areas were highlighted for special attention on a regional basis. First, was the need for academic and professional educational programs that focus on integrated natural resources management and development, to be designed on a regional basis. Administratively, such programs could be managed through a network of inter-institutional accreditation networks, which involves institutions devoted to higher education, technical training and extension services. Second, was the need for greater coordination among Caribbean NGOs interested and involved in the development process. Many considered that this would enhance the already considerable influence and value of the NGO movement in the sustainable development process.

Postscript

It was not the purpose of the Conference to recommend a sustainable development strategy for the Caribbean. Rather, it was to highlight the strategic policy issues that political and development planning forums should consider in formulating a longer-term substantive and institutional strategy for sustainable development in the Caribbean region. The issues and ideas outlined above, together with the following papers by Yves Renard and Angela Cropper and the closing remarks to the Conference made by CARICOM Secretary-General Roderick Rainford, provide a framework of priorities for action for these ongoing debates.

Rethinking the Development Process: The Cultural, Social and Institutional Agendas

Yves Renard

I. INTRODUCTION

This week's deliberations have clearly demonstrated that many of the obstacles to ecological sustainability are not of an environmental nature, but rather of a cultural, social, institutional and political nature. Our concerns for the environment and development require entirely new approaches, a new vision and new practices. They have confirmed the need for a more holistic concept of development that would not only be concerned with the satisfaction of basic needs and the alleviation of poverty, but would also be concerned with issues of cultural integrity, social equality and harmony, and environmental quality.

My purpose is to complement other contributions and to propose some concrete directions that could be taken on the cultural, social and institutional fronts to alleviate current problems and to shape a new course that would allow us to meet present needs without compromising those of future generations. In this sense, what concerns us here are the challenges posed by other speakers at this conference, and identifying the actions that are now required to arrive at more sustainable forms of development.

II. MOBILIZING AND ENHANCING OUR TALENTS.

Our first challenge is to recognize the incredible richness and diversity of our own talents, and to design strategies that mobilize and, indeed, enhance such qualities. We need to find ways to mobilize the genius and wisdom of Caribbean peoples, so that we can

use and enhance our human and intellectual capital. This, in my view, requires work in six main areas.

Cultural Integrity and Self-esteem

One of the myths of the conventional approach to development is that development can be equated to expansion of material production conceived in purely quantitative terms. For many years, development planners gave absolute priority to growth rates over the satisfaction of needs. In the classical theories of development, there was little room for what could be termed the human factor, there was little recognition that culture is a precondition of development and progress.

The first direction, therefore, is clearly cultural because no human enterprise can be successful without the cultural foundation that gives it sense and strength. It is an action that is inspired by the region's tradition of resistance. It is an action that acknowledges the external forces that are at work to maintain a status quo of dependency and fragmentation. It is an action that eradicates the dependency syndrom from the mind, in order to allow its eradication from the economy and society. It is an action that builds self-esteem and confidence. It is an action that understands, in the words of Guadeloupean poet Saint-John Perse, that "all creation of the mind is essentially poetic."

This means the preservation of cultural integrity and the encouragement of cultural expression must be essential parts of our developmental strategy. It means, as well, that the cultural dimension must be incorporated in all development actions to permit creativity and the satisfaction of spiritual and cultural needs.

Popular Knowledge and Traditional Wisdom.

The second area requiring action is more specific and demands recognition that popular and traditional knowledge of the environment is extensive, and that such knowledge is a valuable asset when defining improved management and developmental strategies. Indeed, it is curious that when we conceive sophisticated fisheries developmental plans, agricultural diversification strategies and forestry management plans we often forget to involve the very people who are to benefit from such plans and whose knowledge would be a valuable asset in the planning exercise.

New developmental strategies demand that we respect and mobilize such talents, and that we build on what exists.

Scientific Knowledge

This popular knowledge is useful, but it must be complemented by new scientific information, and by translation into the technological tools for production, management and development. Indeed, central to our new strategies must be an increased allocation of resources for science and technology, and greater support for the regional and national institutions involved in these domains.

Science is needed to allow us to monitor the status of the environment and the impact human activities may have on the resource base. It is needed to diagnose the problems, so that we understand the root causes. It is needed to carry out a more systematic exploration and evaluation of resources available for development. Indeed, it is needed to put the concept of sustainability into practice, to give us the instruments that we need to:

- diversify energy sources and increase energy efficiency;
- improve waste management and production efficiency;
- attain sustainable agriculture;
- rehabilitate degraded ecosystems and resource enhancement;
- practice environmental and resource economics.

Community Education

The relevance and usefulness of scientific knowledge, however, largely depends on public awareness and education. It is an area that should create or strengthen awareness of environmental issues and of their relevance to development. It is an area that should build, within each and every citizen, not only an ability to identify issues, but also a capability to analyze them and to understand the causes of the problems.

What we are talking about is not only a campaign to sensitize people to a particular issue, nor is it the publication of resource materials relevant to the region. It is not only the integration of environmental subjects into the curricula of our schools that will equip us with the tools required to cope with all relevant situations, but also a profound transformation of education is needed, to make it part of community life and to provoke encounters of previously isolated disciplines.

Therefore, there can be no reformulation of development without a reformulation of education, and without the inclusion of education in our agenda for action.

Community Participation

Public education is a prerequisite for community participation and is required at all levels. It is required, first of all, for reformulating development, and broad consultations must take place to create a dialogue and to generate new responses to current challenges. It is clear that the new development paradigm will not be created—as the old paradigm had been—by so-called development experts. It will arise out of a dialogue among all sectors of society—including the experts—through an extensive process of consultation and participation.

Public participation is also needed at all stages of development planning for designing projects, and in implementing management activities. Public participation must guarantee closer integration of resource management and development efforts that utilize local talents and respect population needs. As well, it should ensure more equitable access to resources and their benefits.

Training

Development of adequate human resources is essential to this strategy. We must build our capability to cope with issues of development and sustainability.

My brief observation at this stage concerns the relevance of training. We must ensure that training enables us to better cope with the issues and population needs. Indeed, we must question and evaluate the impact some of our current training efforts have on environmental and developmental challenges, and realize that some of our most highly trained people remain unable to cope with real-life situations.

III. DESIGNING A NEW INSTITUTIONAL LANDSCAPE

The second challenge before us is designing a radically new institutional landscape. Experience has shown that our present institutional frameworks are, in many ways, incapable of meeting the needs that have been identified during this conference. Indeed, inadequate institutional arrangements can often be blamed for the existence of such problems. In shaping a new landscape, five general areas should be considered.

Coordination of Public Policies

To prevent the environmental problems described during this conference, and to implement new policies and programs capable of mobilizing the resources necessary for the provision of benefits on a sustainable basis, we must establish adequate mechanisms for coordination and harmonization. Many of our difficulties result from a sectoral approach to developmental planning and resource management, and our inability to link the various concerns and disciplines, as well as to the absence of an institutional framework within our governments for central coordination.

In the region, several formulas to establish such coordinating mechanisms have already been tested with varying degrees of success. Now, each government should undertake a review of institutional arrangements—where it has not already been done—to provide a basis for setting-up these coordinating mechanisms.

Placing Environmental Decision-making Where it Matters

We must ensure that critical decision-making with regard to the environment is placed where it really matters when considering institutional reform. Very often, problems occur because the environmental dimension is not properly integrated into development planning and management. We must link ecological considerations to the economic, trade, infrastructural and other dimensions of development, so that we ensure all of these dimensions are considered simultaneously.

We must expand environmental expertise within planning and finance ministries and, at the same time, expand economic expertise within resource management and environmental agencies.

Strengthening Public Sector Capabilities

In emphasizing inter-sectoral coordination and integration of environmental factors into economic planning, it should not be forgotten we also need to strengthen sectoral resource management agencies. Indeed, in our region, stronger public institutions are clearly needed in key sectors such as forestry, water management, fisheries and marine resource management, soil conservation and management of coastal conservation, etc.

This can be effected in several ways. First, by allocating the financial resources and staff needed to do this work, but also by increasing opportunities for participation in integrated, development planning efforts.

Non-governmental Institutions

In the search for more sustainable forms of development, non-governmental organizations also have a critical role to play. Indeed, such organizations have traditionally been at the forefront of environmental action, and it is probably useful to remind ourselves—now that there is a consensus on the importance of environmental issues—that it is the courageous and pioneering work of environmental groups that has contributed to the creation of such an awareness. Now, these organizations continue to have a very important role to play in informing the public and in advocacy of the issues.

However, the role of environmental non-governmental organizations should not be limited to education and lobbying, as they can do much, in partnership with governments, in environmental monitoring and management. It is, therefore, time—as demonstrated by the promising example of collaboration between the Government of Jamaica and the Jamaica Conservation and Development Trust—for governments in the region to explore opportunities for collaboration with non-governmental institutions in a more systematic way.

It is also urgent for the non-governmental sector to realize that concern for and interest in the environment should not be limited to specialized institutions, but that NGOs should also integrate environmental concerns into developmental programs. This means one of our priorities should be to ensure that the environmental dimension is on the agenda of existing developmental agencies; namely, chambers of commerce, cultural groups, development foundations, tourism associations, etc.

Community-based Resource Management

Institutional reform should also promote effective community responsibility for natural resource and environmental management. Management responsibility should be shared by the government and community groups that represent resource users. The region must now systematically explore this radically new area if we want to ensure that the majority of people are both actors in and beneficiaries of development.

The agenda for this is very clear. Community institutions must be strengthened and concrete methods identified whereby farmers' organizations, fishermen's co-operatives and village councils can assume some responsibility for management of natural resources and the environment.

IV. PREPARING A CARIBBEAN FUTURE

The third challenge has already mobilized the energy and creativity of many—it is a road full of obstacles, on which the Caribbean has already travelled far, but where there remains a long way to go. It is the challenge of building—out of many dispersed, scattered and unique pieces—a true region, united in its search for development.

The Regional Dimension of the Environmental Challenge

Environmental issues are useful reminders of the imperative of integration and co-operation. Oil spills, migratory birds and fisheries stocks have little to do with the frontiers of politics and language. Economic growth demands stronger intra-regional links, more functional co-operation, and more joint ventures involving several Caribbean partners. Economic and ecological sustainability require larger markets, sharing of skills, and more movement of capital.

We must understand that the issues we are discussing cannot be addressed through national agendas alone. They also require regional approaches and regional solutions, and our search for more harmonious and more sustainable forms of development is, therefore, inextricably linked to the struggle for regional integration.

A Commitment to Regional Institutions

We must, therefore, renew our commitment to the institutions the region has already created to serve the process of integration, beginning with the political and economic structures, the Caribbean Development and Co-operation Committee, the CDB, the Caribbean Community and the OECS.

Governments of the region must also maintain and increase their support to and participation in the Caribbean Environment Programme, sponsored by UNEP, coordinated out of Jamaica. This program, which brings together all countries of the wider Caribbean region, is a unique opportunity for harmonizing policies, for coordinating efforts and for concerted action. It is a source of technical and financial assistance, and manages activities in such important areas as pollution monitoring, environmental legislation, and specially protected areas and wildlife.

At the Caribbean Community level, one must note the importance of the coordination process instituted by the CARICOM Secretariat following the successful first Ministerial Conference on the Environment in 1989. The creation of the Consultative Forum on

the Environment, which followed that conference, is indeed a very significant step toward better coordination and programing in the environmental field.

Another important institution, created within the framework of the Caribbean Community, is the CEHI, based in St. Lucia. The CEHI carries out important research, training and technical assistance programs, notably in the fields of solid-waste management, water quality, toxic substances management, agro-chemicals and environmental impact assessment.

Governments of the region have also demonstrated their commitment to environmental management through their membership and participation in the CCA, a regional non-governmental organization that has both governmental and non-governmental membership. The CCA is particularly active in public education and community awareness. It also facilitates networking and provides technical assistance to its members in environmental planning, environmental impact assessment, etc.

In natural resource management, another important organization is CANARI, a non-governmental body that is particularly active in the field of training, protected areas management, and community-based resource management. Indeed, CANARI is presently mounting a regional program in community-based management, which involves a wide network of development agencies, training institutions and professionals in the region.

The role played by the University of the West Indies should be supported and strengthened. The University and several of its bodies deserve special mention, including CERMES at Cave Hill, the Institutes for Social and Economic Research in the three campuses, and the Consortium Graduate School of Social Studies. All are involved in important programs that are directly relevant to our concerns.

With regard to tertiary education, there is another development that should be mentioned, creation of the Consortium of Caribbean Universities for Natural Resource Management. The Consortium is a grouping of fourteen institutions of higher learning in the region, and its objectives include all aspects of co-operation, notably sharing of expertise among universities and the development of joint programs.

Broadening the Scope of Co-operation

In strengthening these institutions, we need to broaden the geographical scope and effectiveness of existing instruments. Indeed, as noted earlier, it is imperative that we overcome some of the old barriers, so that we can prepare a future of meaningful co-operation and integration. Among the small number of regional institutions

that have successfully removed some of the barriers of language and politics, there are four environmental organizations; namely, the Caribbean Environment Programme, the Caribbean Conservation Association, the Caribbean Natural Resources Institute and the Consortium of Caribbean Universities for Natural Resource Management.

On other technical fronts, and on the political front, it is probably time to set clear agendas and timetables, to ensure the divisions and fragmentation that are the root of many of the region's problems are abolished in this decade.

Tackling Regional Priorities

If we wish to develop as a region, then it is essential that we tackle regional priorities for environmental management and sustainable resource utilization. Let us examine, briefly, two of these priorities.

The first priority is Haiti. Haiti, maman libete, a country and a people who have given so much to the region during our history, and who are now receiving so little from us, in their time of need. It is impossible to discuss environmental priorities in the region, and at the same time overlook a situation that is one of the most dramatic in the world today—a situation that presents the region with one of its most formidable challenges. I am, therefore, suggesting that we place Haiti high on a regional political, environmental and developmental agenda.

Another clear priority, which stems from our new responsibility for managing an exclusive economic zone, is the management and use of marine resources. There are many opportunities for a regional approach to sustainable marine resource utilization in the fields of energy, fisheries, mariculture and tourism.

V. GEARING-UP FOR ACTION AND CHANGE

The fourth challenge is simply to act, to do things differently, and to effect change on the ground. For sustainability to be achieved, an overall strategy must be established. Most of the elements of this strategy have already been suggested at this conference, especially those relating to economic policies. In this process, however, we may have lost track of some of the environmental policies. I should like therefore, to suggest four key elements that are essential to effective environmental policies.

Maintaining Ecosystem Productivity

We should maintain and, indeed, enhance the productivity of the ecosystem, to conserve biological diversity and to preserve options. We must ensure that resources are not dilapidated, and that the system is allowed to renew itself.

Mobilizing Resources

We must recognize that while some elements of our environment may be exploited beyond sustainability, there are also resources that are underexploited, and that are available for development. An essential part of our developmental strategy therefore, must be to explore these potential resources and to permit their contribution to cultural, social and economic development. We must also improve access to resources, and permit a more equitable distribution of benefits from their uses.

Minimizing Impacts

The strategy should minimize, as much as possible, the impact of human activities. We must first of all, evaluate the impacts of such activities and then use the results to assess the potential impacts of policies, programs and projects. This would entail, as well, investment and technologies that would minimize negative effects.

Managing Wastes

We must manage wastes, by reducing the energy content of growth, by limiting waste production, by recycling, and by adequate treatment and disposal.

VI. CONCLUSION

I started by emphasizing the need for a reformulation of development, and this conference is certainly making a significant contribution toward that definition. But we must remain humble, and place our current concerns in a proper perspective. If we do, we may conclude that since development is both a goal and a process, what should mobilize our energies is not so much the difficult prediction of the future, but the definition of the principles that

development must respect, now, for the future as well as for the present.

Among these principles, we have focused on sustainability because we have legitimate concerns regarding the depletion of natural resources and the degradation of the environment. It must be understood, however, that this is only one principle, among others, that are required: peace, equity, gender equality, cultural integrity and sovereignty. We certainly would not want the current emphasis on sustainability to make us lose sight of these other imperatives.

Influencing International Institutions

Angela Cropper

I. INTRODUCTION

Any discussion about influencing international institutions, in a context of building a framework for discussions about public policy relating to sustainable development, necessarily crosses boundaries of several disciplines and must employ a variety of perspectives. Economic theory and planning, political science and practice, foreign affairs and international relations, social organization and behavioural sciences all come into play. This is accentuated when one is discussing the topic from the viewpoint of small, developing countries that have traditionally relied upon external investment flows, especially during the last two decades. And the operations of international institutions have been central to the process.

Three sets of considerations provide background for this discussion:

- those presented in Plenary I of this Conference, the specifics of which, though relevant, will not be repeated here;
- analysis of economic relations between the developed and developing world and discussion relating to the outcome of interventions made by dominant financial institutions, which are presented elsewhere, are sufficiently topical in the region to provide a point of reference for this discussion without being repeated here;
- perspectives and insights founded upon personal, individual and collective experiences of Caribbean people with representatives of international institutions, and apprehended in the context of diplomatic discourse; points of view, feelings, known sentiments, situations experienced, and privately expressed.

It is recognized that the Caribbean region is attended by a large number of international institutions, ranging from specialized

agencies of the United Nations to financial intermediaries created by the Bretton Woods Agreement, secretariats of geographic or economic blocs, governmental agencies, and non-governmental organizations. Any attempt to seriously explore possibilities for influencing them will require clinical analysis and understanding of the political, policy, financial, technical, and bureaucratic dimensions of their operations. At the moment, they are considered generically—as a group of intermediaries between the developed and developing worlds—and generalized statements are made. It will be appreciated, however, that these observations may not apply uniformly in every instance.

II. STRUCTURAL AND RELATIONAL DIFFICULTIES

The type of conditionality that attaches to developmental assistance administered by international institutions is well known and understood by all. And the impact of the conditions applied by major financial institutions on the development process and prospects, in the context of stabilization and adjustment support to developing countries, has already been canvassed in this Conference.

There are other difficulties, however, which emerge in the dynamics of the relationship between international institutions and developing countries, that are not quite as overt in their application and impact as conditionality. I consider these dynamics to be no less important because they silently and insidiously operate to confound serious efforts to organize our own affairs, and in so doing devastate the human resources engaged in the process.

Let us explore a few of the more remarkable features of this relationship.

On the Part of International Institutions

The Very Large Number of Institutions Active in the Caribbean

In the aftermath of World War II arrangements for economic support and reconstruction of ravaged economies were centered on the International Bank for Reconstruction and Development (The World Bank) and the International Monetary Fund (IMF). At the same time, the United Nations was created, and, in turn, spawned an array of specialized agencies and programs. Added to these are a multitude of other multilateral, bilateral and non-governmental

organizations that are actively involved in assisting or initiating development in the region.

Over time these organizations have (unconsciously?) widened their terms of reference and the scope of their interventions. Now there is considerable overlap in their developmental activities, with every facet of economic and social arrangement falling within their collective purview.

Moreover, they represent different constituencies, governing arrangements, policy positions, program approaches, and financing arrangements; they present their agendas and activities in the context of their own policies and programs gratuitously and independently, as determined by their headquarters to be in the interests of developing countries. Taken together, the multiplicity of arrangements and activities pose a tremendous challenge and impose a heavy burden on small countries hoping to achieve coherence in domestic situations.

This is exacerbated when projects and activities offered by institutions do not emerge from a cohesive plan and program developed within national processes. We are all familiar with the phenomenon of personnel from international institutions foraging through the region for a few weeks and producing policy papers for our countries and strategy documents for the region, often with only the most perfunctory engagement with technical, managerial and political counterparts at the national and regional levels.

The Developed-country Perspective of Institutions

Almost without exception, the headquarters of these organizations are located in the rich, industrialized, developed world, and are heavily influenced by the perspectives and ethos of those societies. Their policies and approaches, and the means they advocate for achieving goals, are generally not informed by perspectives of the developing countries to which they are directed. We have recently witnessed the speed with which major international institutions have seized the baton of Environment and Sustainable Development and have moved to incorporate new demands into their financing policies and arrangements, demands that reflect the perspectives of those who have already enjoyed the luxury of affluence.

The Technical Overlay of Institutions

International institutions establish and rely on their own technocratic base, leaving little scope for the technical issues to be determined by the expertise of the developing countries, even where that exists. Moreover, in the Caribbean region we have traditionally behaved as

though what comes from abroad is automatically superior, especially where the possibility exists of some resources being made available to apply to the situation in hand. This has resulted in countries being too ready to accept whatever is offered without adequately scrutinizing and adapting the proposal to the local situation.

The Resource Base of Institutions

International organizations can respond more quickly—on several fronts at one time and through a network of tentacles, if necessary—than individual governments or national and regional institutions are able to do because they command vast financial and information resources, which allow them to readily provide leadership and direction where they deem it to be required. That they assume it to be unavailable and ignore whatever organic and, therefore, more gradualistic processes might be underway within a country or within the region is regrettable.

The Political Alignments of Institutions

International organizations are generally vulnerable to the internal political postures and external alignments of countries that exercise dominant control over their practices. One or other country in this region has experienced being out of favour with one or other organization at one time or another.

On The Part of the Caribbean

The Character and Condition of the Economy and the Polity

The slow movement toward economic and financial independence on the part of developing countries can be attributed to:

- inadequate domestic savings and investment that result in continued reliance on external investment flows;
- impotence in improving patterns of economic organization and trade, which then fosters chronic dependence;
- neglect of research and development that is conducive to transforming their economies;
- international, economic and political inhibition of their self-determination of domestic policy and programs;

- lack of urgency in formulating coherent long-term policy and programs;
- lack of political disposition, security and strength to resist the imposition of approaches and measures, even when they are patently at variance with all that is held dear, and are overtly subversive of previous gains;
- the need for short-term performance by governments that is engendered by the political process;
- little involvement by civil society in the determination of and, consequently, no responsibility for public policy, etc.

All of the above conspire to increase reliance on international institutions, to augment their role in planning, organization and management, and to have domestic policy once more established from outside.

Small Technical and Managerial Base

The small corps of technical and managerial staff spread over the total development effort tend to be overburdened by the demands made on them by the many institutions that are active in the field, each having its own requirements for planning, management, reporting and accounting for the various activities they initiate and support. This situation, coupled with other factors—the resources that institutions command, the demands of their own approval/fiscal/programing cycles, the requirement to employ their own expertise—reinforces the effects of the structural and political characteristics explored above.

Short-term Horizons

The pressure on governments to satisfy the needs and expectations of societies, precludes long-range perspectives. Short-term approaches are encouraged by the fiscal policies and programing cycles of international institutions, which constrain commitments of their resources for the long term. The project approach provides a respectable hedge for institutions against long-term commitments, while it provides the governments with sources of extra-budgetary support that enable them to embark on a high level of activity, in response to the demands of society for performance. The pledges made by the recipients of counterpart contributions, to continue the activity begun with external support, often quietly fade away in the process. Meanwhile, the institutions are able to cite these activities as instances of their support and goodwill for developing countries,

and to satisfy the various interests that they serve. For both institutions and governments the process is mutually supportive and mutually reinforcing.

Political Access

The ready access to high political levels, especially in small societies, which representatives of international institutions obtain, often results in confusing and confounding the advice of, and positions taken by, local officials and technocrats. This dynamic has already been cited by Cletus Springer as the "political override of the management process." In the extreme, the practice belies the existence of domestic expertise; it emasculates the technocrat, eroding his confidence, and assaulting his psyche; it engenders apathy and inertia that creates an even greater vacuum and causes even more reliance on interventions from outside. And so on—a cycle continues.

The Ugliness of Small

Given the small size of the societies and the closeness of the polity, few opportunities for lateral and vertical mobility exist. This further constrains the positions taken by local officials and technocrats, and the political override is not resisted.

Passive Participation in International Forums

The absence of arrangements for rapid, systematic and coordinated information flows, the overburdened technical and managerial base, and the lack of strategy and coordination in mobilizing around the issues—all lead to inadequate preparation by individual countries for participation in meetings of the governing bodies of international organizations and other similar forums. Yet at the regional level, incipient arrangements for consultation and coordination of positions are not effectively utilized to devise collective and coordinated representation.

Being ill-prepared, small, and feeling insignificant at international meetings, countries often passively observe the proceedings, which are in any case fairly ritualistic, the major participants usually having taken positions and having made alignments long before the meeting takes place. Yet the policies and programs ostensibly debated and decided provide the fons et origins for subsequent initiatives and interventions by institutions.

The 'Fiction' of Integration

Commitment to regionalism and Caribbean destiny, elsewhere fervently avowed, is readily jettisoned when there are contending national interests.

In a relationship characterized by the above dynamics, the position of developing societies is akin to hitching a ride: any vehicle will do; right or left drive is unimportant; driver's license or ability to drive is irrelevant; speed and style of driving are given; ready acquiescence to any point of view for fear of having to forego the ride and be left to make it on foot is understood; but they are still in danger of being dropped off at the benefactor's whim if another, more attractive passenger appears along the way.

III. THE FALLOUT FROM INTERNATIONAL DEVELOPMENT ASSISTANCE

Clearly, there is a need to change the parameters of such a relationship if we hope to influence international institutions.

The cumulative effect of policies pursued, and of the above dynamics, is increasingly being called into question. The outcome for developing countries, at the end of three United Nations development decades, when an array of institutions have actively been involved in the development process, is remarkable:

- realities of the debt crisis;
- setbacks in welfare and equity, arising out of inappropriate policy and iniquitous conditionality;
- negative net transfers from developing societies to developed societies;
- inequitable terms of trade;
- instability of prices for their primary, traded products;
- lack of significant progress in transforming the economies;
- erosion of the social infrastructure and human capital, painstakingly built up over time.

All of the above indicate that present approaches to international developmental assistance appear to be inimical to the long-term interests of developing countries.

This does not imply that perceptible positive results from the activities of and interactions with particular organizations are non-existent. But overall, existing approaches and arrangements should be re-examined where the present reality diverges from the goals of developing societies.

This is all the more urgent given the advent of environmental considerations on the global agenda. And it is accompanied by an acute consciousness in the developed world of its vulnerability to environmental disharmony and disequilibrium, a consciousness that provides a new raison d'être for interest in the economic developmental strategies pursued by the less developed world, especially as they relate to use of its natural resource endowments.

IV. ENVIRONMENTAL PROTECTION AND PRESERVATION, SUSTAINABLE DEVELOPMENT, AND INTERNATIONAL INSTITUTIONS

Historically, developed countries have been motivated to co-operate with developing countries, including Caribbean countries, because of market considerations for their manufactured products, as sources for primary materials and low-cost labour to support their production, for geo-political advantage, for balance of power, or as a result of former imperial ties.

However, in the present international economic and political balance, and from the perspective of the Caribbean, traditional economic and geo-political motivations are now regarded as having less significance in negotiations with the developed world and the institutions that it controls. What, then, are the prospects for influencing a new international economic order or the international institutions that orchestrate and administer its arrangements?

It is tempting to conclude that the prospects for doing so are so small that further discussion may be futile. Such a conclusion would, however, reinforce the very conditions that deny us a greater degree of self-determination and an impact on world affairs. Though the latter may be illusory, the former provides sufficient justification for exploring possibilities and for establishing structures that would attain that objective. The resolve to do so is very important, given the threat of new economic domination through the principles, priorities, processes and procedures being propagated by the developed world and its institutions with regard to environmental matters.

Important as environmental issues are for all societies, the main advocates for environmental protection and conservation are the rich, developed countries that have already attained levels of welfare to which the developing world still aspires.

The commonality of concern, the recognition of mutual vulnerability, and the realization of global interdependence in designing and achieving solutions create a powerful, motivating force

for renewed interest by the industrialized world in the developing world.

There is increased awareness and understanding of the causes and environmental impacts of developmental approaches and technological applications used in the developed world. This is accompanied by the stark realization that all societies are vulnerable to global, ecological deterioration and disequilibrium. Developed countries have, however, amassed the financial and technological means to redress the negative impacts to some extent. Meanwhile, they advocate restraint by developing countries in the consumption of resources, in their search for improving the welfare of their people.

International institutions are already reflecting related considerations and conditions in their policies to meet this objective. The 'green' conditionality was formulated to determine for developing countries what is to be produced, how much, by what means, and at what price. The effect of this would not only constrain the possibilities for growth, but would exert undue influence by these institutions on determining the social and economic relations within developing societies.

Despite the absence of powerful economic or political factors that could be used as leverage in international economic relations, Caribbean countries need to organize themselves to resist such encroachment. What set of considerations and actions would assist small, disparate, disadvantaged societies in doing so, given the dynamics of their relationship with the international community?

The only possible avenue appears to derive from the following observations made by Jim MacNeill during Plenary I of this Conference. Industrialized countries are, clearly, responsible for a disproportionate share of the world's pollution and of the rapid depletion of the Earth's ecological capital and, consequently, the argument went, they have a corresponding responsibility to provide the lead in measures to reverse these trends. However, it was felt, there was little evidence that the key western governments are as yet prepared to shoulder the responsibility in ways that make a difference. That presentation concluded by observing that Caribbean countries have an enormous stake in the outcome of future global discussions on sustainable development. "Your governments," we were advised, "can be highly influential in the councils of nations, and you should not allow your size to deter you in any way from playing a strong role in the negotiations on these issues. You may be small in terms of geography and population, your contribution to global warming, deforestation and other syndromes may be equally small in the aggregate, but your stake in measures to limit them could be survival itself."

If those perspectives energize us in our quest for finding ways to influence international institutions, then the challenge is to ensure that the arrangements are established for achieving quickly:

- the systematic evolution of coherent national and regional agendas for environmental preservation and sustainable development, in which strategies, principles, priorities and programs are clearly enunciated;
- adequate preparation of collective positions and coordinated representation in relevant forums; and
- widespread public participation in the process so that policies, programs and positions are supported by the collective will of the societies on whose behalf they are advocated.

These measures are important, not so much for their potential to enable Caribbean countries to influence international institutions and international relations generally, but because they constitute an inescapable set of imperatives for the progress and long-term viability and social stability of Caribbean society, as well as for the attainment of its goals, both material and developmental.

Increasing attention is at present being given to the requirements for achieving coherent national and regional agendas and there are incipient arrangements applicable to coordinated positions. There is a need, though, to strengthen commitment and effort with regard to both of these objectives. The attainment of widespread public participation will, however, require considerable attention.

V. PUBLIC POLICY DISCUSSIONS FOR SUSTAINABLE DEVELOPMENT

What is Public Policy?

Public policy comprises that body of generalized goals, objectives, principles and decisions outlined from time to time by a government, from which the apparatus of state and society take direction. In the systems of political organization practised in the region, this is normally conveyed to citizens in the manifestoes of groups vying for government leadership. The significance of that manifesto relative to other considerations in the vote of the electorate is itself unknown. Moreover, the goals, objectives and principles espoused may or may not be reflected in the arrangements and relations that ensue between government and society. (Manifestoes are not necessarily assimilated by those who propagate them, let alone by the electorate.)

The process by which such public policy is formulated and given expression is not uniform: it may emerge entirely from the minds of government leaders; it may be postulated and applied from the technocratic level in the public service, in state enterprises, or in institutions that serve the state; or it may evolve out of interaction between these groups. The process does not normally allow for systematic incorporation of the views and values of the body politic, or for its participation in the thinking and analysis of what should be the precepts and principles, the long-term goals and objectives for which the society should organize itself and deploy its resources.

Public Policy for Sustainable Development

The formulation of public policy for sustainable development would require a fundamental departure from such a process.

The history of civilization reveals that a conjuncture of events and issues, ideas and understanding appears from time to time and leads us to new modes of thought, of organization and management, of economic and social relations. The world at present is at such a conjuncture. The task is to search for new paradigms in:

- economic thought and economic organization;
- notions of equity (within societies, among societies, between generations);
- political relations among nations;
- social organization and popular participation.

The concept of sustainable development is an ideal—a philosophical precept—that needs to be incorporated into our way of understanding and into the processes and structures by which mankind regulates itself. The search for new appropriate paradigms will require a fundamental examination and re-ordering of individual and societal values:

- application of stringent economic considerations and criteria;
- acceptance of their repercussions on commodity and service prices;
- imposition of limits to individual and societal aspirations for material benefits;
- exercise of self-denial even where there may be ability to pay;
- measurement of public welfare that incorporates notions of present benefits alongside consideration of future obligations;
- manifestation of new value systems for individual and social behaviour;
- realization of new dimensions in ethical and moral behaviour;

- attainment of full and effective public participation.

This realization indicates that public policy for sustainable development, formulated in keeping with the above imperatives but determined without widespread information, education, and participation, will be resisted by civil society. Where ideology, principles, practices, economic relationships, allocation of resources, etc. are all decided exclusively by the managers of the moment, their imposition relies upon regulatory frameworks and the apparatus to enforce them.

In the matter of environmental protection and preservation, and sustainable development, however, effectiveness will require policy to evolve from the maximum involvement of the individuals on whose values, behaviour, attitudes and action its application will depend. Sustainable development, in other words, would require the manifesto to be given by the people.

From this perspective, governments would be regarded as short-term managers, with responsibility for devising and operating the mechanics—the systems, arrangements, procedures, allocations, etc.—that would give effect to the values and principles indicated by society: for it is the people who are continuous, not the governments; it is they who think in generational, and not merely electoral, spans.

This reversal of the normal process would achieve a transparency currently lacking in the decisions and arrangements that governments make on behalf of society. It would be the process through which the non-negotiables of the society are identified and defended. It would achieve cohesion and stability within the society, and would provide the strength and security from which its representatives might engage with international institutions and the rest of the world.

Public participation, it is readily conceded, is not a new idea or a new buzz word. It has been around for a long time. But it has not been realized in any systematic or structured way because it is taken for granted. We appear to have a romantic notion that it is a condition external to ourselves, and we operate as though mere invocation of its merit is sufficient for its realization. It should be perceived both as a value and as a process that has to be cultivated through long and painstaking effort. It requires time, energy, and organization. And it should be pursued and serviced in a conscious, organized, and systematic manner.

We were reminded in Plenary II of this Conference, by Donna McFarlane-Gregory, that Caribbean societies are drawn from civilizations that for centuries had organized their affairs, managed their resources and sustained their development. We need to find ways of drawing upon that native wisdom for interpretation and action, to counteract materialism.

It will require a societal effort to create the context for releasing popular will and wisdom, and for realizing public participation in the formulation of public policy. In this effort, an uncommonly high demand for supplying information and analysis, and for expending time and energy, will be made of those who have benefited from opportunities given by Caribbean societies. At the same time, it is incumbent on Caribbean citizens to provide the bulwark for their governments and their societies as they interface with the rest of the world. The responsibility is not merely to intellectualize about the issues in conferences of this kind; the challenge is to unite thought with action, to believe with fervour and to pursue with vigour that which we propound.

Toward a Framework for Public Policy Discussions

In the context of the perspectives explored so far, any framework for public policy discussions will need to provide for information generation and utilization, multi-disciplinary insights about the phenomena and the solutions, and the widespread and genuine involvement of civil society. These processes are inescapable, given the nature of the issues; and they are applicable, whatever the level of the analysis—to a project, within a community, for a national plan, or for a regional approach.

Within any Caribbean country, and for the region as a whole, it will be necessary to:

- actively stimulate the interaction of relevant professions and perspectives to achieve a better and more holistic understanding of such a universal concern as sustainable development;
- involve the public and individuals of no particular scientific or disciplinary pursuit to combine rationality with the intuitive reasoning of ordinary people;
- incorporate considerations of human ecology into any discussion of environmental issues and sustainable development;
- take initiatives to forge and foster citizens' groups that will advocate the issues, educate people about the causes and solutions, and build the basis for acceptance and conformity to the desired values and behaviours;
- construct from this process new modes of thought, new notions of social, international and inter-generational equity, and new perceptions of what should be public policy;
- establish arrangements for improving information circulation—ideas, points of view, principles, experiences—to build approaches that will facilitate the process and achieve mutual support among the key players;

- ensure unity and coherence between approaches in foreign policy and external relations on the one hand and environmental planning on the other, so that a proper relationship is achieved among environmental degradation and natural resource issues, international trade, monetary policy, domestic policy, external relations;
- deepen the understanding of technocrats and bureaucrats about the links between environment, development, sustainable development, international relations and goals of independence, self-reliance, autonomy, Caribbean destiny;
- organize regionally to influence international institutions by ensuring there is clarity about what is to be done—how, by whom, and according to principles and processes determined within our society;
- organize regionally to influence international dialogue and decisions through effective participation in international forums by adequately preparing for discussion of the issues, applying regional perspectives and maintaining solidarity, and systematically examining treaties/conventions to select those most relevant to our needs and most consistent with the agreed positions propagating, ratifying and applying them;
- urgently establish coherent institutional structures for consultation, coordination and management, and adequately support their operation with the necessary resources;
- revise the traditional concept of public policy as being a matter for governments, as distinct from society;
- identify and deploy resources—people, time, information, organizations—to build community involvement in determining and taking responsibility for public policy.

Regional Unity of Purpose and Action

Even if all of the above were achieved, however, Caribbean countries could not hope to exercise influence in the international community if their approach is not founded upon unwavering commitment to regional unity, both in purpose and action. Bilateral engagements with institutions that command superior resources and with countries that have political power in the international order increase the vulnerability of Caribbean countries, their governments and their representatives.

But unity of purpose and action cannot be achieved merely by invoking a perspective of the region or by declaring a commitment to regional integration; it can be achieved only through systematic building and use of the incipient mechanisms that exist for regional consultation and coordination. Assertions about regional integration

must be matched by exertions for it. And, more important, regional positions and approaches, consensually derived and collectively endorsed, must provide the perspective for representatives of individual countries, even when they are acting in their sovereign, national capacity.

Jeffrey Dellimore observed at this Conference, that in external affairs it is only on the issue of apartheid that Caribbean countries have maintained an unassailable and unimpeachable solidarity. We can draw strength from recognizing that, in so doing, we have made a contribution to the development of civilization. There is now both a need and an opportunity for environmental protection and preservation and for sustainable development to constitute a new platform for demonstrating Caribbean unity of purpose and action, and for moving us to a higher threshold of integration. And with confidence, borne out of that experience, we might seek out brethren elsewhere—societies with similar motivations and aspirations—to build the coalitions that will be necessary to attain and maintain some balance in the international order.

This plea for regional unity of purpose and action has already been summed up in this Conference by P. J. Patterson when he said, "we should all march to the same drum." But it must be our drum, and we must be the drum-beaters, so that our progress might be more in keeping with our own innate and indigenous rhythms. For this is where we and our progeny are, and live, and have our being.

Closing Remarks

Roderick Rainford

I would like to express gratification at the successful effort that brought the Government of Jamaica, the Institute for Research on Public Policy and CARICOM together to co-sponsor a Conference on the special sustainable development challenges facing the Caribbean. In particular, I am pleased to recognize the special role of the IRPP both in organizing the Conference, and in mobilizing the resources from CIDA that have made it a reality. Indeed, we also wish to thank CIDA for the funding provided.

I am also mindful that this Conference on Sustainable Development in the Caribbean is an integral part of the preparatory process for the Tripartite Regional Economic Conference that will be held in Trinidad and Tobago in November of this year. From the outset, it occurred to many of us that in terms of the medium and long-term future of the Caribbean, the Regional Economic Conference would only be successful if sustainable development was a major subject of focus in its deliberations.

It was a happy circumstance, therefore, that these concerns coincided with the IRPP's interest in convening a Conference on sustainable development in the Caribbean. For when we asked ourselves what we would do with the results of the general kind of articulation that would take place in a forum on sustainable development, one immediate and obvious answer was to link this exercise to the Tripartite Regional Economic Conference.

In general, we wanted to ensure the impact of the rich exchange of views and perspectives and the creative cross-fertilization of ideas that has taken place in your discussions over the past two and a half days would not end here. Broadening the horizons and deepening the sensitization of the participants, important though this might be, is not enough when the participants in a conference such as this are, by definition, to be numbered among the converted. Rather, we took the view that by mobilizing all of the elements for this Conference, and by bringing together a dazzling array of regional experts to focus on the theme of sustainable development, we would create an asset from which we could draw an output that could

affect various developmental initiatives that are either already in train or that are yet to be conceived and launched in the Caribbean. I regret that circumstances prevented me from being present yesterday and the day before, but from what I have been able to learn about the Conference proceedings, there is every indication that we should be able to achieve this objective.

As such, the results of this Conference could become part of the activities being pursued in the Caribbean aimed at taking stock of our present situation in the world, our future prospects, and the new forms and directions of action needed to enhance and protect the quality of life and welfare of the people of the region. I refer to activities such as the Regional Economic Conference, which I have already mentioned; the work of the West Indian Commission; the consultation process on education policy and strategy; the work of the Association of Caribbean Economists; and the work of the principal women's organizations in the region.

The Conference, in its previous sessions, has deliberated on the full range of substantive sectoral issues highlighted in the program, both intensively and extensively. Many of the philosophical and generic policy issues that arise within the conceptual framework of sustainable development have been explored, as well as the operational meaning of sustainability itself. I, therefore, will not pronounce, in any definitive way, on issues. I will confine myself to some broad observations, and will focus as much as possible on the challenges we face: to reinforce current efforts; to launch new initiatives; and to deal in a practical way with sustainable development.

No doubt, the point will already have been made that at the very heart of sustainable development is the question of how we do things; how we interact with one another and with the physical world around us; how we consciously plan to so interact; how we anticipate consequences and consciously let these consequences affect our interaction. From a sustainable development perspective, the issue is, therefore, the creation of a relevant paradigm for planning and action that becomes almost second nature (which historically is what most paradigms have become), and that harmonizes our developmental interaction with the earth's natural rhythm and inexorable evolution to whatever its ultimate destiny is in the universe.

Such a paradigm could entail not only the planning and action that are needed, but also the mode and structure of the procedures for planning and action. If this sounds like a plea for bureaucracy, the only thing I can say is that while we are conscious of the deadening inertia that bureaucracies can sometimes generate, at the same time I do not know of an entity in history, whether in the private or public sector, that has been able to pursue sustained and

organized action without a bureau. It is not a question, therefore, of whether or not there is a bureaucracy, but rather it is a question of the ethos that pervades a given bureaucracy.

I believe the framework for action and planning in a sustainable development mode should operate on at least four levels: broad consciousness-raising, articulation, diagnosis and identification of the categories and direction of action needed, and the forging of consensus on these; the designing of concrete interventions, whether in the form of plans, programs, measures or projects, that will be the instruments through which we act on identifiable and intelligible results that emerge from the first level of action; practical implementation of properly designed interventions; and evaluating what we have implemented, in the context of our basic goals and objectives, and providing feedback into the ongoing action that should be taking place at the preceding three levels.

I believe that we come face to face with the essential crisis of our time in the Caribbean when we look at matters in this way, as well as with the pressing need for an almost agonizing self-appraisal.

General articulation of issues and identification of needs must be pursued more or less continuously, even at the risk of repeating ourselves, because new insights and new understandings are always emerging, as experience unfolds. However, my several years of observation and experience have led me, regrettably, to the conclusion that, with a few outstanding exceptions, we in the Caribbean are very long on general articulation and identification of needs, but are alarmingly short on the disciplined design and implementation of precisely conceived interventions.

This phenomenon is perhaps due in part to long-established patterns of social behaviour and education that have attracted us to high-profile, general articulation rather than to patient and painstaking sculpture and implementation of concrete interventions that would correct perceived problems. Let me hasten to add, lest I be perceived as adopting a "holier-than-thou" attitude, this is a malaise that affects all of us, and reflects an aspect of the Caribbean condition that we must consciously address, individually and collectively.

Let me briefly turn now to another important aspect of organizing ourselves for planning and action for sustainable development. From the perspective of concerned and informed citizens and public affairs technocrats and political managers at all national levels in the Caribbean, a proper paradigm, or system for planning and action, in a sustainable development framework must be capable of responding to challenges arising in at least three distinct dimensions. I am suggesting we look at matters from the perspective of people within national societies, for, ultimately, sustainable development is about protecting and enhancing the

welfare of people within whatever national communities they happen to be living, and is not about the creation of regional or international empires that would take on a raison d'être of their own!

First, there are national management issues to be dealt with, even though some of these might have spill-over effects across national boundaries. In the long run, development, insofar as it is affected by factors essentially within the national purview, can only be sustained by inculcating the right habits and behaviour patterns into the minds of the local populace, and by establishing appropriate national machinery, regulations, and procedures to ensure of publicly and privately sponsored developmental initiatives are correctly oriented. External, bilateral and multilateral agencies may, by invitation or otherwise, inject themselves into the national sphere to execute particular substantive tasks affecting sustainable development, but that alone can only be a temporary palliative. We confront here the matter of a man being given a fish instead of a fishing rod. Creating an institutionalized capacity at the national level to identify, choose and pursue options for sustainable development, with or without external technical inputs, continues to be of utmost importance and, indeed, should be a priority for external assistance.

On a second dimension, the sustainability of development of the people in a particular Caribbean national community may, in common with people in other national communities within the region, be closely influenced by factors that can only be managed effectively, and more optimally, through joint and collective action. It could be on the scale of a sub-regional grouping such as the OECS, or within the Caribbean Community, or on a Pan-Caribbean scale, or on any other relevant permutation, depending on the issue involved.

Identifying the issues and their respective regional constituencies is perhaps one of the most complex challenges to co-operation within CARICOM and the wider Caribbean. Involved are a struggle with protective barriers around special sectional or institutional interests and the promotion of a common language for communication and a common purpose among politicians and technocrats at the national and regional levels, and in international organizations that co-operate with us.

As far as this whole area is concerned, I think we are at a very critical stage in the unfolding of certain recently launched regional initiatives. It appears to me, however, that so far we have experienced two contending perspectives in developing this initiative. On the one hand, there is the perspective of uncoordinated, laissez faire initiatives made by an array of regional and international bodies, all seeking to carve out and protect their turf. On the other hand, there is the image of a rigidly centralized, regional machinery for identifying, developing and implementing regional program

initiatives in the field of environmental protection and management, and sustainable development. Clearly, the range and the complexity of issues that arise make either of these scenarios entirely inappropriate for Caribbean circumstances and regional needs. Some of us, who have been grappling with the challenges in this field, hold the conviction that we need to create and institutionalize a process and structure of co-operation that will result in all of the institutions, within and outside the region, continuing to play a role in a coordinated manner so that we are able to avoid overlap and duplication, and can produce a clear and discernible cumulative impact in a commonly agreed direction.

On a third dimension, the sustainable development goals and needs of people within our communities in the Caribbean are closely affected by factors that call for global and international management. I am sure that it will already have been recognized in the deliberations of the Conference that notwithstanding different interpretations of the available evidence among the scientific gurus, the issue of climate change is an ominous cloud on the horizon, in that it portends impact of sea-level rise on low-lying areas and of more frequent and more intense hurricanes in the Caribbean and elsewhere. The implications of faultily designed and badly operated nuclear reactors are also of direct concern to our sustainable development. These threats do not arise from anything we in the Caribbean are doing or are not doing within our boundaries, yet they directly affect our lives. Can we wait passively to be affected? We need not look further than the old tried and tested English Common Law principle that if you are affected on your property by a nuisance that stems from action taking place on somebody else's property, you have a right to have the nuisance abated or to sue for damages, or both. We know that the principles of municipal law become very attenuated at the international level, but it is clear that part of the challenge we face on this third dimension is organizing ourselves to shape an effective voice in the Caribbean and to join with others in the global community with similar concerns to press for credible international norms and mechanisms that will address threats to our sustainable development and that can only be effectively managed and controlled on a global basis.

The sustainable development challenges in the Caribbean require the building up of politically and administratively viable processes and institutional arrangements at national and regional levels so that we can pursue the articulation, sensitization, and identification of properly conceived program and project interventions, as well as evaluate and assess the implementation of interventions.

Much remains to be done at the national level in most of the region to achieve this kind of capacity. There were encouraging developments about a year ago when the region got together in a

successful first CARICOM Ministerial Conference on the Environment. That Conference adopted the *Port-of-Spain Accord*, which, I believe, has already been mentioned. For the first time, the region spoke at the political level with one voice on a range of basic common concerns affecting the environment and sustainable development, including institutional arrangements. It was decided to pursue coordinated identification of needs, and program development and implementation at the regional level. The arrangements are on two tiers, comprising the Ministerial Conference itself, which we expect will meet from time to time as needed, and a Consultative Forum of Regional and International Institutions involved with, or interested in supporting programs in the region relating to the environment and sustainable development. To date, the Caribbean core of the Consultative Group has met three times, and once at the full Group level, with each successive meeting honing the Group into an instrument for co-operation and coordination at the regional level.

In the long run, of course, the success of this experiment will depend, on how effectively the CARICOM Secretariat can perform its coordinating role and on the seriousness and commitment demonstrated by the participating agencies.

This coordination machinery, combined with effective networking arrangements between environmental agencies, functioning at the technical and scientific level—the Caribbean Environmental Health Institute, the University of the West Indies, and the Institute of Marine Affairs—and working with national machinery and bilateral and multilateral agencies, should, in due course, produce a well articulated institutional infrastructure that will support sustainable development planning and action.

In planning for sustainable development, we should: increasingly base our material culture on resources that renew themselves, and manage the use of such resources in a way that does not compromise their inherent capacity to renew themselves; exploit non-renewable resources with technologies that do not degrade the integrity of the surrounding ecology; adopt and pursue disciplined, medium to long-term strategies that use part of the income flow from industries, based on wasting assets, to establish alternative economic activities when these wasting assets are exhausted; put in place systems and mechanisms to effect expeditious recovery from periodic devastation wrought by nature on the social and economic infrastructure of our communities.

I am often described as being an optimist. But if there is any prospect of realizing an institutional infrastructure at the national and regional levels, animated by a new and relevant paradigm of planning and action for sustainable development, then I would like to believe that this Conference will help to energize that process.

Key to Acronyms

CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community and Common Market
CCA	Caribbean Conservation Association
CDB	Caribbean Development Bank
CEHI	Caribbean Environmental Health Institute
CEP	Caribbean Environment Programme
CERMES	Centre for Resources Management and Environmental Studies
CFC	Chlorofluorocarbon
CIDA	Canadian International Development Agency
COMET	Standing Committee of Ministers of the Environment
CTO	Caribbean Tourism Organization
CTRC	Caribbean Tourism Research and Development Centre
CUBIC	Caribbean Uniform Building Code
DAWN	Development Alternatives with Women for a New Era
ECNAMP	East Caribbean Natural Area Managment Project
EIA	Environmental Impact Assessment
EPZ	Export-Processing Zone
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GNP	Gross National Product
IDB	Inter-American Development Bank
IFC	International Finance Corporation
IMF	International Monetary Fund
IRPP	Institute for Research on Public Policy
MAB	Man and the Biosphere Programme (UNESCO)
NGO	Non-Governmental Organization
NRMP	Natural Resource Planning Management
NRMU	Natural Resource Management Unit (OECS)
OAS	Organization of American States
OECD	Organization of Economic Cooperation and Development
OECS	Organisation of Eastern Caribbean States

OPEC	Organization of Petroleum Exporting Countries
R&D	Research and Development
RCU	Regional Coordinating Unit (UNEP/CEP)
REAP	Regional Environmental Protection Agency
SLP	St. Lucia Labour Party
TNC	Transnational Corporation
TUEI	Trade Union Education Institute
USAID	United States Agency for International Development
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USVI	United States Virgin Islands
UWI	The University of the West Indies
World Bank	International Bank for Reconstruction and Development
WRMIS	Water Resources Management Information System

Appendix 1
Conference Program

PUBLIC POLICY IMPLICATIONS OF SUSTAINABLE DEVELOPMENT IN THE CARIBBEAN REGION

JAMAICA CONFERENCE CENTRE
MAY 28-30, KINGSTON, JAMAICA

Sponsored By:
CARICOM
The Government of Jamaica
The Institute for Research on Public Policy

In Collaboration With:
Caribbean Conservation Association
UNEP-Caribbean Environment Programme
The Organization of Eastern Caribbean States
The University of the West Indies

"In 1987, the World Commission on Environment and Development, under the chairmanship of the Honourable Gro Harlem Brundtland—former Prime Minister of Norway, challenged all peoples, countries and regions of the world to devise and adopt more sustainable forms of development. Sir Shridath Ramphal, a member of the Commission, ensured that the Caribbean played an important role in articulating this challenge. The United Nations General Assembly agreed in 1989 that the challenge posed by the Commission will be the focus of a global conference to be held in Brazil in 1992.

"Nowhere is the sustainable development challenge greater than in the Caribbean since the development prospects of all our countries are so dependent on protecting, preserving and enhancing diverse and fragile ecosystems. We must determine how this might be best achieved to the benefit of all our citizens. I am confident that this Conference will be of utmost importance to the Tripartite discussions on development planned for CARICOM countries and for the on-going sustainable development deliberations within and among countries of the wider Caribbean region.

"The Government of Jamaica is happy to be a co-sponsor for the Conference and looks forward to welcoming you to Kingston."

The Honourable P. J. Patterson
Deputy Prime Minister of Jamaica
Minister of Development, Planning and Production

PUBLIC POLICY IMPLICATIONS OF SUSTAINABLE DEVELOPMENT IN THE CARIBBEAN REGION

JAMAICA CONFERENCE CENTRE MAY 28-30, KINGSTON, JAMAICA

CONFERENCE PROGRAM

MAY 28, 1990

09:00-09:30 **OFFICIAL OPENING** – *The Honourable P.J. Patterson*

09:30-12:00 **PLENARY 1 - THE CHALLENGE OF SUSTAINABLE DEVELOPMENT**

Economic and ecological systems are totally interlocked in the real world, but they remain almost totally divorced in our institutions. In the Caribbean region, sustainable development depends on the effective maintenance and enhancement of diverse and fragile ecosystems. The real world will not change: attitudes, institutions and policies which shape the development process must.

Chair: *The Honourable Winston Dookeran*
Minister, Ministry of Planning and Mobilization (Trinidad & Tobago)

The Global Perspective: *Jim MacNeill*
Secretary General of the World Commission on Environment and Development; Director of Sustainable Development Program, IRPP

The Institutional Challenge: *Ausbert d'Auvergne/Cletus Springer*
Permanent Secretary/Principal Assistant Secretary, Ministry of Planning, Personnel, Establishment and Training (St. Lucia)

The Development Challenge: *Helen McBain*
Research Associate, The University of the West Indies

MAY 28, 1990

14:00-17:00 **PLENARY 2 - THE ECONOMICS OF SUSTAINABLE DEVELOPMENT**

What reforms in production and market incentives, resource and economic accounting systems, structural adjustment measures, and financing policies are critical for promoting more sustainable forms of development?

Chair: *The Honourable Winston Dookeran*
Minister, Ministry of Planning and Mobilization (Trinidad & Tobago)

Speakers: *Norman Girvan*
Director, Consortium Graduate School of Social Sciences, The University of the West Indies

Donna McFarlane-Gregory
Director, Economic Planning, Ministry of Development, Planning and Production (Jamaica)

Clive Thomas
Director, Institute of Development Studies, University of Guyana

Delisle Worrell/Keith Worrell (paper introduced by Byron Blake)
Deputy Governor, Central Bank of Barbados/Director, Economics and Programming, Caribbean Development Bank/Chief Country Economist, Caribbean Development Bank

Discussants: *Byron Blake*
Director, Industry and Economics, CARICOM

Yvonne Hyde
Permanent Secretary, Ministry of Economic Development (Belize)

MAY 29, 1990 - PANEL I - NATURAL RESOURCES MANAGEMENT

09:00-12:00 **A. Land and Freshwater Resources**
What shifts in agricultural, forestry and urban management policies and practices are required to protect, preserve and enhance land capabilities, land use and freshwater supplies including reducing the impacts of hurricanes and coping with potential climate change?

Chair: *David Gibson*
Permanent Secretary, Ministry of Industry and Natural Resources (Belize)

Speakers: *Dan Chalmers*
Regional Coordinator, FAO - CARICOM TFAP

Thorant Harduare
Managing Director, Underground Water Authority (Jamaica)

Gloria Knight/Jacqueline daCosta
President, Jamaica Mutual Life Assurance Society (formerly General Manager, Urban Development Corporation)/Chairman, Town and Country Planning Authority (Jamaica)

Discussants: *Franklin MacDonald*
Director, Pan-Caribbean Disaster Preparedness and Prevention Project/UNDRO

John Spence
Faculty of Agriculture, The University of West Indies

O.A. Ken Boyea
Managing Director, The East Caribbean Group of Companies Ltd., (St. Vincent)

14:00-17:00 **B. Marine and Coastal Resources**
What shifts in fisheries, tourism, and coastal management policies and practices are required to protect, preserve and enhance the marine and coastal resources base including reducing the impacts of hurricanes and coping with potential sea-level rise?

Chair: *Beverly Miller*
UNEP - Caribbean Environment Programme

Speakers: *Ivor Jackson* (paper summarized by Ed Towle)
Ivor Jackson and Associates

Bisessar Chakalall
FAO-Fisheries

Clement Lewsey
Morgan State University and Consultant (Trinidad & Tobago)

Leonard Nurse
Coastal Conservation Unit, (Barbados)

Discussants: *Wayne Hunte*
Director, Bellairs Research Institute (Barbados)

Edward Towle
President, Island Resources Foundation (USVI)

Luther Miller
Caribbean Tourism Organization

MAY 29, 1990 - PANEL II - PRODUCTION, PROCESSING AND CONSUMPTION OF NATURAL RESOURCES

09:00-12:00 **A. Productivity Improvement and Waste Management**

What shifts in science, technology, infrastructure and management policies and practices are required to reduce the natural resources and energy content of growth, increase productivity and protect, preserve and enhance the natural resource base?

Chair: *Trevor Farrell*
Chairman, TRINTOPEC

Speakers: *Naresh Singh*
Director, Caribbean Environmental Health Institute

Desmond Ali
Deputy Director, Caribbean Industrial Research Institute

Keith Panton
President and Chief Executive Officer, ALCAN Jamaica Company

Discussants: *Jeffrey Dallimore*
Chief Project Officer, Corporate Policy and Planning, CDB

Pat Thompson
Executive Director, Caribbean Association of Industry and Commerce

14:00-17:00 **B. Human Resources Development**

What education, employment and public awareness/participation policies and practices, including gender considerations, are required to enhance natural resources management measures and facilitate adjustments to more sustainable forms of development?

Chair: *Walter Chin*
Head, Agency for Health Sciences, Education, Environment and Food Policy (Guyana)

Speakers: *LaVerne Ragster/Peter Bacon* (paper delivered by LaVerne Ragster
Consortium of Caribbean Universities for Natural Resources Management

Trevor Munroe
Secretary General, Universities and Allied Workers Union

Peggy Antrobus
Women and Development Unit, The University of the West Indies

Discussants: *Barbara Boland*
Population Affairs, ECLAC

Lorna Gordon-Gofton
Lorna Gordon and Associates

Calvin Howell
Executive Director, Caribbean Conservation Association

MAY 30, 1990

09:00-11:30 **PLENARY 3 - THE TRANSITION TO SUSTAINABLE DEVELOPMENT**

The Caribbean region and its inhabitants are living through a totally new situation with challenges and opportunities unmatched in human experience. The realities of this new world have not yet been reflected in human behaviour, science, economics, institutions of government or international institutions. The challenge is to encourage transition to more sustainable forms of development as rapidly as possible.

Chair:	*William Demas* Governor, Central Bank of Trinidad and Tobago
Small Island Economies: Environment and Growth	*Carlyle Mitchell* Director, Economic Affairs, OECS
Constraints and Opportunities	*Carlos Quesada* Biomass Users Network, Costa Rica
Rethinking the Development Process	*Yves Renard* President, Caribbean Conservation Association
Influencing International Institutions	*Angela Cropper* Director, Functional Cooperation, CARICOM

11:30-12:00 **CLOSING REMARKS**

Roderick Rainford
Secretary General, CARICOM

Appendix 2
List of
Background Papers

Ali, A. Desmond. *Science, Technology and Sustainable Development in the Caribbean.*

Antrobus, Peggy. *Human Resource Development: Public Awareness/ Participation Policies and Practices.*

Blommestein, Erik. *Some Thoughts on Sustainable Development in the Caribbean.*

Chakalall, Bisessar. *Policy Issues for Sustainable Fisheries Development in the Caribbean.*

Chalmers, Dan. *Natural Resources Management in the Caribbean Region: Forestry issues with Particular Reference to the CARICOM Countries Particularly in the FAO Tropical Forestry Action Plan (TFAP).*

Cropper, Angela. *Influencing International Institutions.*

Girvan, Norman P. *Economics and the Environment in the Caribbean: The Case for a Marriage*

Gordon-Gofton, Lorna. *(Human Resources Development—Paper Unnamed).*

Hardware, Thorant. *Water Resources Management for Sustainable Development.*

Hunte, Wayne. *Comments on Policy Implications of Sustainable Development of Coastal and Marine Resources in the Caribbean.*

Jackson, Ivor L. *Tourism and Sustainable Development in the Caribbean.*

Knight, Gloria and Jacqueline daCosta. *Urban Development and Management: Implications for Sustainable Development.*

Lewsey, Clement D. *Reassessing Policy Alternatives for Sustainable Development in Coastal Areas: Implications for the Caricom Caribbean.*

MacNeill, Jim. *A Global Perspective.* Address to the Caribbean Regional Conference.

McBain, Helen. *The Development Challenge and Strategies for Achieving Sustained Economic Growth in the Caribbean.*

McFarlane-Gregory, Donna. *The Economics of Sustainable Development.*

Mitchell, Carlyle L. *Small Island Economies: Environment and Growth.*

Munroe, Trevor. *Labour and Sustainable Development.*

Nurse, Leonard A. *The Deterioration of Caribbean Coastal Zones: A Recurring Issue in Regional Development.*

Panton, Keith S. *Strategies for Achieving Sustainable Development in the Bauxite/Alumina Industry—One Company's Perspective.*

Quesada, Carlos. *Constraints and Opportunities to Sustainable Development.*

Ragster, LaVerne E. and Peter R. Bacon. *Human Resources Development: Education and Training in Resource Management in the Caribbean.*

Renard, Yves. *Rethinking the Development Process, the Cultural, Social and Institutional Agendas.*

Sejenovich, Hector. *Natural Patrimony Accounting—An Indicator for Evaluating Sustainable Development.*

Singh, Naresh C. *Potential Climate Change and Sustainable Development in the Caribbean.*

Singh, Naresh C. *Waste Management and Sustainable Development in the Caribbean.*

Springer, Cletus and Ausbert d'Auvergne. *Institutional Challenge of Sustainable Development: A Politico-Administrative Perspective.*

Thomas, Clive Y. *Economic Policy and Sustainable Development in the Caribbean.*

Worrell, DeLisle, and Keith Worrell. *Economics of Sustainable Development.*

Appendix 3
List of
Conference Registrants

Alexander-Huntley, Teresa, Ministry of Planning, Saint Lucia.
Ali, Desmond, Caribbean Industrial Research Institute.
Allen, Gerrard, Geography Department, UWI.
Anderson, Marcel A., Natural Resources Conservation Dept., Jamaica.
Anderson, R.E., ALCAN Jamaica Company.
Anthony, Debra, Inter Press Service, Jamaica.
Antrobus, Peggy, Women and Development Unit (WAND), UWI.
Applewhite, Clyde C., United Nations ECLAC, Sub-Regional Office.
Armstrong, James, U. N. Centre for Human Settlements, Barbados.
Bacon, Peter, Zoology Department, UWI.
Baker, Peta-Anne, Association of Development Agencies (ADA), Jamaica.
Ballayram, Mr., Consortium Graduate School, UWI.
Banjo, Bob, Alcan Sprostons Limited.
Barrett, Ina, Department Of Government, UWI.
Bartram, Ina, UW
Bell, Yvonne, Restoration Resources Agency, Jamaica.
Bernal, Margaret, Bureau of Women's Affairs, Jamaica.
Blake, Byron, Director, Industry and Economics, CARICOM.
Blommestein, Erik, United Nations ECLAC, Sub-Regional Office.
Boland, Barbara, United Nations ECLAC, Sub-Regional Office.
Bowen, Wenty, CARIMAC, UWI.
Boyea, Ken, Eastern Caribbean Group of Companies Limited, St. Vincent.
Brente-Tinker, Jaunta, UWI.
Brenton, Reid, Jamaica Agricultural Society.
Brown, Philbert, National Meteorological Service, Jamaica.
Callender, Dorel, Caribbean Organization of American States.

Campbell-Brown, Nadeen, CARITECH Associates.
Cassell, Lorenzo, Government of Montserrat.
Cattan, Andrea, Fisheries Division, Jamaica.
Chakalall, Bissessar, Food and Agriculture Organization.
Challenger, Brian, Organization of Eastern Caribbean States.
Chalmers, Dan, FAO-CARICOM Tropical Forestry Action Plan.
Charles, Patricia, National Research and Develop. Found., Saint Lucia.
Chen-Young, Paul, Eagle Merchant Bank of Jamaica Limited.
Chin, Lenan, Forest Industries Development Co. Limited, Jamaica.
Chin, Walter, Health Sci., Educ., Environment and Food Policy, Guyana.
Cholmondeley, Hugh, United Nations Development Programme, Jamaica.
Chow, Barbara A., Marine Science Unit, UWI.
Clarke, Pamela, UWI.
Corrie, Natallie, Consortium Graduate School, UWI.
Cox, John, Institute for Research on Public Policy, Canada.
Crompton, Doreen, World. Bank.
Cropper, Angela, Education and Environment, CARICOM.
DaCosta, Jacqueline, Town & Country Planning Authority, Jamaica.
Dellimore, Jeffrey, Caribbean Development Bank.
Demas, William, Central Bank of Trinidad and Tobago.
Dixon, Cheryl, Planning Institute of Jamaica.
Dixon, Owen, ALCAN Jamaica Co.
Dookeran, Hon. Winston, Minister of Plng. & Mobil., Trinidad & Tobago.
Douglas, Joy, Jamaica Conservation and Development Trust.
Doyle, Peter D., ALCAN Jamaica Co.
Edwards, Herbert G., ALCAN Jamaica Co.
Embree, Sid, Institute for Research on Public Policy, Canada.
Farrell, Trevor, TRINTOPEC, Trinidad & Tobago.
Field, Ralph M., USAID.
Foster, Elaine, Natural Resources Conservation Department, Jamaica.
Foster, H. H., ALCAN Jamaica Co.
Fowler, Mary, CIDA.
Frigenti, Laura, United Nations ECLAC, Sub-Regional Office.
Garraway, Eric, UWI.
Gayle, Richard C., ALCAN Jamaica Co.
Gibson, David, Ministry of Industry and Natural Resources, Belize.
Gilliard-Payne, Barbara, University of the Virgin Islands.
Girvan, Norman, Consortium Graduate School, UWI.
Gordon-Gofton, Lorna, Lorna Gordon & Associates, Jamaica.
Gray, Calvin R., National Metecrological Service, Jamaica.
Greaves, Jacqueline, Publisher's Association, UWI.
Green, Gina C., The Nature Conservancy.
Hamer, Faith, Inter Press Service, Jamaica.
Hardware, Thorant, Underground Water Authority, Jamaica.

Hayden-Singh, R., T. Geddes Grant Limited, Jamaica.
Headley, Sam, Ministry of Development Planning & Production, Jamaica.
Hodges, Stephen, Construction Resource and Develop. Centre, Jamaica.
Howell, Calvin, Caribbean Conservation Association.
Hughes, Wesley, Planning Institute of Jamaica.
Humes, Doris, Caribbean Development Bank.
Hunte, Wayne, Bellairs Research Institute, Trinidad & Tobago.
Hyde, Yvonne, Ministry of Economic Development, Belize.
Irving, D.B., Ministry of Agriculture and Commerce, Jamaica.
Ishmael, Len, CERMES, UWI.
Jackson, Dionne, UWI.
Jackson, Ivor, Ivor Jackson & Associates, Antigua.
Jackson, Trevor, UWI.
Jefferson, Owen, Bank of Jamaica,
Jones, Margaret, UWI.
Kabuka, Solomon S., University of the Virgin Islands.
Kean, Orville, University of the Virgin Islands.
Kirton, Allan, Ministry of Development, Planning & Production, Jamaica.
Knight, Hon. Gloria, Jamaica Mutual Life Assurance Society.
Lawson, L.A., Lawson & Associates Limited, Jamaica.
Levy, Horace, Social Action Centre/ADA, Jamaica.
Lewis, Winston, ALCAN Jamaica Co.
Lewsey, Clement, Morgan State University, U.S.A.
London, Ethley, The University Council of Jamaica.
Lothian, Rob, Canadian High Commission, Jamaica.
Lyn, Cowell, Wallace Evans & Partners, Jamaica.
MacDonald, Franklin, U.N.D.R.O.
MacNeill, Jim, Institute for Research on Public Policy, Canada.
Mattis, Ann, Consultant/Editor, Jamaica.
McBain, Helen, Institute of Social and Economic Research, UWI.
McCalla, Winston, National Environmental Societies Trust, Jamaica.
McFarlane, Dunbar, National Commercial Bank Jamaica Limited.
McFarlane-Gregory, Donna, Min. of Develop. Plng. & Production, Jamaica.
McLarty, Corrine, Corrine McLarty and Associates, Jamaica.
Mendes, Judith, UWI.
Menzies, Donald, National Commercial Bank Jamaica Limited.
Miller, Beverly, United Nations Environment Programme.
Miller, Luther, Caribbean Tourism Organization.
Miller, Malden, UWI.
Mitchell, Carlyle, Organization of Eastern Caribbean States.
Mitchell, Neville, Organization of American States.
Moore, Euna, UWI.
Moore, Robert J., Canadian International Development Agency.

Morrison, Bevon, Petro Corporation of Jamaica.
Munroe, Trevor, UWI.
Neil, Joan C., United Nations ECLAC.
Nelson, Sheila, Min. Health, Labour, Infor. & Broadcasting, Saint Lucia.
Noble, Byron, Producer Services Limited, Jamaica.
Nurse, Elvis, UWI.
Nurse, Leonard, Coastal Conservation Project Unit, Barbados.
Oberli, Andreas, College of Arts, Science and Technology, Jamaica.
Otto, Mary, United Nations Development Programme, Jamaica.
Panton, Keith, ALCAN Jamaica Company.
Panton, L.G., ALCAN Jamaica Co.
Pappin, Francis, Ministry of Planning, Saint Lucia.
Patterson, Hon. P. J., Minister of Develop., Plng. & Production, Jamaica.
Persaud, L., Ministry of Education, Saint Lucia.
Petty, Eugene, Ministry of Development, Saint Kitts.
Pollard, Duke, Kingston, Jamaica.
Quesada, Carlos, Biomass Users Network, Costa Rica.
Ragster, LaVerne, University of the Virgin Islands
Rainford, Roderick, CARICOM Secretariat
Rath, Amitav, UWI.
Reeson, Peter, National Conservation Strategy Secretariat, Jamaica.
Reid, Art S., ALCAN Jamaica Co.
Reid, Brenton, Jamaica Agricultural Society.
Renard, Yves, Caribbean Conservation Association/CANARI.
Runnalls, David, Institute for Research on Public Policy, Canada.
Sangster, Alfred, College of Arts Science and Technology, Jamaica.
Sejanovich, Hector, United Nations Environment Programme.
Seymour, Oswald, Urban Development Corporation, Jamaica.
Shurland, Deirdre, UWI.
Simmons, David A., Caribbean Conservation Association.
Singh, Naresh, Caribbean Environmental Health Institute.
Spence, John A., UWI.
Spiro, Eran, Environmental Committee, Jamaica.
Springer, Cletus, Min. Plng, Personnel, Establish. & Train., Saint Lucia.
Steele, Russell D., UWI.
Stewart, Basil, Jamaica Record.
Stewart, Marian, ALCAN Jamaica Co.
St. Hill, Yvonne, Barbados Environmental Association.
Tai Chun, Marcia, ALCAN Jamaica Co.
Taylor, G.A.(Van), Scientific Research Council, Jamaica.
Thomas, Clive, University of Guyana.
Thompson, Pat A., Caribbean Assoc. of Industry and Commerce.
Tomlinson, Lincoln, Alcan Sproston Limited, Jamaica.
Towle, Edward, Island Resources Foundation, USVI.

Wade, Barry, Petroleum Corporation of Jamaica.
Weekes-Francis, Sarita, Montserrat National Trust.
Wellington, Karl, ALCAN Jamaica Co.
White, Michael N., Hydrology Consultants Limited, Jamaica.
Williams, Gwendoline, UWI.
Wilman, John C., Alcan Jamaica Co.
Wiltshire, Winthrop, UNESCO.
Wolffe, Christian, College of Arts, Science and Technology, Jamaica.
Woodley, J.D., UWI.
Worrell, Delisle, Central Bank of Barbados.
Worrell, Keith, Caribbean Development Bank.
Wright, Sandra, UWI.
Yaw, Fitzgerald John, UWI.

Mo
Mu
Nei
Nel
Nol
Nu
Nu
Ob
Ott
Pa
Pa
Pa
Pat
Pe
Pet
Pol
Qu
Ra
Rai
Rat
Re
Rei
Rei
Rer
Ru
Sar
Sej
Sey
Sh
Sin
Sin
Sp
Spi
Sp
Ste
Ste
Ste
St.
Tai
Ty
Th
Th
To
To

Appendix 4
Constraints and Opportunities to Sustainable Development

Carlos A. Quesada

I. INTRODUCTION

The task of offering a presentation in the last plenary session of this conference, on the topic of constraints and opportunities for sustainable development, presents the risk of being redundant. Valuable and detailed information has already been offered by previous speakers regarding both the unsustainable tendencies imposing serious limitations to long-term global sustainable development, and an array of options available to revert the process. Some of the obvious restrictions are:

- exponential growth rates of the population, the economy, and energy consumption;
- loss of arable land to urbanization, desertification, and soil erosion;
- increasing problems concerning the generation and accumulation of urban solid waste;
- the implications of toxic waste burials on ground water;
- dumping of pollutants into the ocean;
- massive extinction of species due to habitat reduction, illegal trade, hunting and poaching;
- the pollution of surface waters by industrial and raw sewage discharges, and by sediment loads, due to poor agricultural practices, overgrazing, and overall lack of watershed management;
- widespread and inadequate use and disposal of pesticides;
- alteration of global cycles by increasing greenhouse gases, and the consequences of global warming and the rising sea level;
- vanishing forests, both by tropical deforestation and the effects of acid rain on the forests of northern latitudes;
- ozone depletion by pollutants released into the atmosphere;
- alteration of local and regional, natural and human environments, intensifying the effects of natural disasters;

- problems associated with urban environmental degradation by massive concentrations of people, and the degradation of human habitats by the expansion of slum areas;
- exploitation of marine and coastal resources and ecosystems beyond carrying capacity;
- disappearance of valuable wetlands;
- irrational utilization of non-renewable resources, such as minerals, much of which is wasted in the production of weapons and military equipment and facilities;
- a widening social gap that results from social and economic processes supporting unsustainable wealth and perpetuating unsustainable poverty;
- outdated and rigid educational systems that do very little to eradicate widespread ignorance regarding the role the natural environment and its resources play in the development process and the quality of life;
- limitations of national governments, especially those of the developing countries, to effectively protect and manage their natural resources, due to a chronic insufficiency of financial resources, corruption, and lack of professionalism in the public sector;
- limited availability of quality information on natural resources for sound decision-making;
- disappearance of the cultural and technological heritage of traditional cultures that operated on the basis of sustainability;
- problems with inefficient and environmentally unsound modalities of land-use occupation;
- nature of international aid, usually more designed to fit the interests of the donor countries than the needs of the recipient nations;
- unfair international trade terms between the developed and less developed countries that accentuate the internal financial crises and growing external debts of the developing countries, and in turn, put additional stress on their natural resource base.

On the other hand, never in the history of mankind have more options existed to revert most of these unsustainable processes. A few examples are: (1) the advances in science and technology, such as the new developments in materials, products and processes, that improve efficiency in production, allow for more effective waste treatment, and make recycling feasible; (2) the advances in bio-technology; (3) increasing options for soft energy alternatives such as wind, biomass and solar energy; and (4) the continuous revolution in communications and information technology, which could easily be used to diffuse the message to the general public about ways, means and options for sustainable development, anywhere on the planet.

There are also other opportunities arising in energy efficiency, sustainable agriculture, voluntary family planning, waste management, protection and regeneration of trees and ecosystems, and better understanding of sustainable utilization of species and habitat management techniques. However, a major step toward sustainability is the proliferation of peace efforts, and the potential benefits from the East-West rapprochement brought about by the democratization in eastern European countries, resulting in less investments in war adventures. As Donella Meadows (1989) stated, "there are no physical or technical reasons that justify that the basic needs of all the people cannot be met. If they are not presently being satisfied it is not due to physical scarcity, but because of the social and political structure."

In order to move away from global and general issues, the practical experience of a real case in a developing country of Central America will be presented. This paper will focus upon some aspects of the methodological process developed for the preparation of the recently completed Conservation Strategy for Sustainable Development of Costa Rica (ECODES).

As will be shown, the systems approach, utilized in the conceptualization of the process to prepare the general and sectorial diagnosis and strategies, enhanced the opportunities to detect options and restrictions to sustainable development at the national, sectorial or regional levels.

The first step in the process of designing the strategy was to offer a clear definition of the sustainable development concept to be utilized. At that time, and still, sustainable development was conceived as:

> "A dynamic process by which the management of natural resources, the enhancement of the human potential, the mechanisms for public participation and awareness, the focus of the technical and scientific development, the formulation of new legal and administrative procedures, the orientation of the economy, and the adoption of ethical principles of environmental responsibility and human solidarity, strengthen the options to satisfy the basic needs, to promote social justice, and improve the quality of life of the present generations, without depleting or irreversibly affecting the ecological base and altering the vital support systems on which future environmental quality and economic development depend."

The second step in ECODES was the definition of clear objectives, to help visualize the obstacles and the opportunities to meet them. ECODES considered nine general objectives, the first three of which were outlined by the International Union for the Conservation of

Nature and Natural Resources, UNEP and World Wildlife Fund. *World Conservation Strategy. Living Resources Conservation for Sustainable Development*, 1980:

- sustainable utilization of the natural resources of the country;
- preservation of the biological diversity;
- maintenance of the essential ecological processes and life-support systems;
- improve the quality of life by meeting the basic needs of the population as well as the satisfaction of their recreational, spiritual and aesthetic needs;
- pursue a balance between rural and urban progress;
- wise management of the non-renewable and scenic resources in the best national interest, in order to contribute to a long-term economic sustainability;
- adoption of realistic long-term population policies considering the limitations of the natural resource base, providing special attention to avoid unwanted and premature pregnancies because of lack of education and social margination;
- increase awareness about the fact that sustainable development involves the promotion of human potential, social justice, a healthy economy, and an ethic of high morality in the public and private functions, and in the conservation and efficient use of the natural resources;
- promotion of individual and collective responsibilities toward nature and human solidarity, to ensure greater harmony among the people and between humans and the natural environment.

The next step was designing a methodology to identify the sectors or components of the strategy, to unify the group's efforts, and to make the sectorial coordinators aware of the role each sector played in the total structure of the strategic planning effort. (Quesada, C. 1988)

Figure 1 shows the main scheme of the integrated systems-approach methodology developed for the Costa Rican Sustainable Development Strategy, which involved nineteen different components or sectors. Emphasis was made on visualizing those sectors driving the environmental demand, those related to the environmental supply, and those sectors that conditioned or resulted from the interaction between the demand and the supply.

The environmental demand is determined both by: (1) the nature of the economy and the country's development style, and (2) by the demographic dynamics and consumption patterns of its social system. In the long run, to be effective, sustainable development strategies need to be financially feasible and socially viable, and they require that the biophysical resources base be maintained within tolerable limits. Therefore, the economy, population growth, and social demands should

not induce requirements that continuously go beyond the financial possibilities, the environmental supplies, and the stability of the life support systems.

The environmental supply, on the other hand, is provided by the availability and characteristics of the nation's basic natural resources, including water, soils, air, forest and wildland resources, mineral resources, biological diversity, marine and coastal ecosystems, and scenic resources. Integrated resources management, as in the case of multiple use of water resources; effective land use planning policies (based on land use capability criteria for agriculture, forestry, wildlands, human settlements, mining, and coastal zoning), and adequate environmental quality guidelines and controls, are needed to enhance sustainable development, maintain options open, mitigate impacts, and revert the degradation process of the biophysical resources of the nation.

Other sectors considered, which influence or result from the interactions between environmental supply and demand, include legislation, education, health, communication, culture, energy, industry, environmental degradation, and science and technology. The culture, education, and communication sectors are of critical value, because of the role they play in the development and conservation processes, in terms of influencing the values and attitudes required for the individual and collective changes toward sustainability.

The multiple interconnections and environmental restrictions and opportunities among all these sectors became obvious in the process of designing the Strategy, from a holistic perspective. However, no matter how well integrated and technically conceived the sectorial and national strategies are, there are two other requirements to be met. According to the scheme following a systems approach presented in Figure 1, those two aspects are: political decision and public participation. The core of the figure, indicated by the inner circle with the heading of "conservation and development policies," intends to stress that a political will and long-term commitment is necessary to start, stimulate and support the Strategy process. The other element is expressed by the external circle enclosing all sectors, and has to do with people. It intends to express that an environmental ethic must be socially developed, based on the concepts of human rights and responsibilities toward the long-term welfare of society and respect for nature.

The analysis and development of the sectorial strategies provided a wealth of information regarding the specific options and limitations within each sector, but because of the nature and length of this paper, these will not be addressed. However, an intersectorial analysis showed that most of the more general and strategic restrictions as well as the opportunities to modify the present course of development could be grouped in a few categories that fit the systems approach utilized in the development of ECODES very well. These categories were common for all sectors and are depicted in Figures 2 and 3, and they were

thought of as state variables of any given sector, since each sector could be categorised by them, as follows:

- the quantity and quality of human resources;
- the level of knowledge or "know-how," expressed in the form of science, technology and information resources available;
- the legal framework, which provides the scope of action as well as the operational standards for the various kinds of institutional settings that make up the different sectors;
- the organization and planning scheme that conditions the functional and operative structure of the sectors;
- the mechanisms of communication and extension—the first one conveys the results of the decision-making process and the operative information within the internal structure and to other sectors, and the second has to do with the external transfer of knowledge and execution of actions for the benefit of the sector's users, or for the general public;
- the inter-institutional coordination constitutes a highly relevant element in a strategy for conservation and sustainable development, given the significant interactions and cross impacts taking place in the activities carried out by the different sectors;
- international links—this component is of critical importance, given the globalization of the economy, and the increasing number and frequency of international contacts between governments, international organizations and people from different nations, as a result of the massive growth of transportation and electronic communication systems;
- financial resources—any social system requires funds to maintain its operation, to develop or buy technology and equipment, build infrastructure, cover wages and inputs, and to generate the goods and services that the system offers to the public. On the other hand, inadequate financial terms and misuse of funds counteract the development efforts.

The sectorial analysis indicates that many of the broader problems and constraints to sustainable development were similar, even for very different sectors. They had to do with aspects related to human resources such as: lack of leadership and unqualified personnel; deficient internal organizational structures; problems with internal communication mechanisms and the lack of effective extension programs; poor inter-institutional coordination resulting in duplication of efforts, or numerous independent policy and actions programs going in opposite directions; inadequate legislation and lack of enforcement; financial difficulties due to chronic scarcity of funds; and problems related to international trade terms, external debt, and unsustainable forms of international co-operation.

In the long run, the necessary changes in the previous aspects, or so called state variables for strategic planning, will be relevant only if they are conceived within a general framework that promotes the convergence of public participation, an environmental ethic, the respect for human rights, and the fulfilment of individual and collective responsibilities.

The previous setting, made up by the state variables and the general framework, constitutes key elements to be considered in any strategic planning effort. As shown in Figure 3, the Strategy becomes the link between the characterization of the system and the definition of priorities for action. In addition, there are other general aspects to consider in the planning and execution of strategic actions at the national, regional or local levels, as shown by the internal ellipsis, linking the state variables, which are: (1) The biophysical and cultural setting, that is, the natural resource base and the cultural characteristics and background of an area under study; (2) the effectiveness in the political decision-making process, since a nation could possess a high-quality human resource base and have natural and financial resources available, but the institutional rigidity and the existing decision-making mechanisms may very well block the fulfilment of proposed actions (the fact that there are presently frequent discussions about the need to reform the state, has a lot to do with this), and (3) the actual power structure and accessibility to resources also constitute critical aspects in the diagnosis and action plans of any strategy. Often, especially at the local and regional levels, the formal and actual power structures do not coincide, or the corruption mechanisms provide access to resources or services to different groups than those originally intended.

The systems approach utilised in sectorial analysis, provided a solid base to detect major strategic problems. Most of them were related to the described state variables and were found to constitute constraints both at the sectorial and institutional levels; and were not too different from those found in the context of other Central American countries. They were:

- lack of an operative institutional framework and procedures to incorporate the environmental variable in the planning process;
- absence of policies on environmental impact studies;
- weak and ineffective interinstitutional coordination despite the existence of formal or legal mechanisms to do so;
- inadequate integration and communication between the sectors in charge of natural resources management, and those related to economic development—the fact that the environmental impact costs are not internalized results in very weak and poorly funded institutions responsible for accomplishing monumental

tasks—therefore, the good intentions never materialise, because of lack of political power and of financial resources;

- fragmentation and dilution of authority and competence in the decision-making process regarding environmental protection because of the numerous uncoordinated agencies managing, utilizing and controlling natural resources, and of abundant, disperse and confusing legislation, difficult to apply—as environmental problems arise, more laws are created, making the situation worse;
- chronic financial difficulties in the public sector that affect the administration, supervision, management, and protection of natural resources and control of environmental quality;
- scarcity of high-quality human resources in the public administration because of lack of stimulus, low salaries, administrative constraints, and limitations of financial resources, infrastructure and equipment to operate efficiently. Competition due to higher earnings in the private sector, restrictions on government spending, and the increasing cost of graduate training abroad, make the official sector weaker in terms of the quality of human resources necessary to carry out sustainable development. In Costa Rica, this internal "brain block" may be as negative as the "brain drain," or worse;
- scarcity of resources allocated to equipment and research to collect and analyze information for adequate planning purposes, even in areas where the countries of the region have comparative advantages—a widening gap in the accessibility to information resources and the lack of applied research impose restrictions in the development of habitat management techniques and the prediction, evaluation, and design of control mechanisms to maintain efficient levels of production and environmental protection;
- severe limitations of communication and extension in the area of environmental degradation, due to a lack of properly trained personnel and adequate means to reach the public, such as information and transportation;
- limitations in international co-operation programs as a result of a multiplicity of disarticulated projects, that in many cases compete for scarce human and financial resources counterparts, and which frequently respond more to the interests of the donor agencies' countries than to the local or national needs;
- loss of values resulting from alien external cultural influences facilitated by the explosion of mass media communication leading to the adoption of values, cultural patterns and development styles that are unsustainable;

- lack of political will for long-term planning, and poor commitment to continue priority projects and initiatives started in previous administrations;
- parallel processes of unsustainable wealth and poverty—the first one frequently resulting from privileges often linked to political power or influence, making it possible for certain sectors to have access to natural or financial resources, in detriment to the lower income groups. This situation perpetuates a vicious circle leading to a dangerous widening of the social gap;
- difficulties in developing the human potential because of deteriorating educational systems, due to both a lack of stimulus for teachers' training, as well as desertion of the most capable personnel because of poor salaries and lack of respect for the teaching profession.

There are two cricital elements among the state variables mentioned above, which must be stressed because of their role in the sustainable development process. They are the human resource base and financial resources. With sufficient and capable human resources, especially at the managerial and leadership levels, and adequate financing, it is possible, over a reasonable length of time, to modify most of these state variables to help eliminate the bottlenecks that perpetuate underdevelopment and unsustainable development. With those two elements it is possible to facilitate the occurrence of others such as: adapt, develop or purchase technology; orient and design the required organizational structure and the communication and extension mechanisms; develop options for internal and external institutional coordination; find ways and means to enhance the capacity for international negotiation; design and promote proper legislation to fit sustainable development requirements; and make better decisions about the kind and number of people to be trained in different areas—to favour technological innovation, strenthening of the economy, environmental protection, and cultural development needed for undertaking a development path in harmony with nature.

From a biophysical perspective, the National Conservation Strategy for Costa Rica considers three priority actions to attain sustainable development: (1) adequate land use zoning according to its land use capacity; (2) control of environmental quality; and (3) integrated resource management at the watershed level. These in turn will help in meeting the three objectives of maintaining the essential ecological processes and life support systems, the preservation of biological diversity, and the sustainable utilisation of species and ecosystems.

From the socioeconomic perspective, social investment and the strengthening of the economy (which if properly oriented are mutually reinforcing by positive feedback loops), must also be obvious priorities

as a way to respectively improve the human resource base and to provide the financial requirements necessary to sustain a desirable development process, as well as to invest in the rehabilitation, management and conservation of the natural environment. In fact, in meeting the biophysical priorities, the human capabilities and the financial resources are essential.

However, and especially for developing nations, there are three wider and more general prerequisites to help attain sustainable development, which are: durable peace, a functional democracy, and the avoidance of wasteful military spending.

As a general statement (since environmentally speaking, problems still persist) post-war development in Japan and Germany constitute good examples of the link between peace, democracy, human development, social investment, economic strength and options for conservation efficiency. Having lost the war, these nations were highly restricted by the allies in their military spending. Thus, they focused their efforts, and initially borrowed financial resources to improve the economy, to adapt and develop technology, and to upgrade the human resource base, as ways to attain efficiency and quality in the production process and to compete for markets. Today, they possess the strongest economies. In 1985 they had the highest energy efficiency in terms of megajoules per 1980 dollar of GNP, with 13.1 for Japan and 14 for West Germany and overall, they rank among the three leading countries in the recycling of aluminum, paper and glass, trailing only behind The Netherlands. The previous figures do not imply that either Japan or Germany are on a sustainable development course. What it does show is that non-military spending pays, and that if human talent and financial resources were allocated for greening the economy, sustainable development could be attained.

Another example, from a developing country perspective, is Costa Rica, which in the 1920s and 1930s was among the poorest countries of Central America and, after abolishing the army in 1949, has become one of the most progressive nations in the developing world. It has been able to attain an important environmental leadership, by effectively protecting a good part of its natural heritage in a well known system of National Parks and Protected Areas. In turn, the preservation and utilization of these areas are proving to be highly productive, offering new employment opportunities, and contributing to the tourism sector, which has become the third major source of foreign exchange due to increasing eco-tourism opportunities. If trends continue, by 1995, tourism is expected to become the number one source of foreign income.

A final aspect to be addressed is that, just as the mechanisms for unsustainable wealth and poverty in the developing countries must be revised, major decisions must take place in the international economic order. The concentration of wealth in the developed world

and the increasing indebtedness of the developing countries is the result of a vicious circle of unfair terms of trade, and of lenders and borrowers, in which the first ones make an important part of their profits from the natural resources base of the poorer countries without properly sharing the benefits. An important element in the reduction of poverty, and for social investment to become a reality, is the generation of adequate financial resources. This could be attained, not necessarily by borrowing, but by participating in the profits of the foreign investments that produce and trade with the resources and products of the developing nations, through valuing and matching the in-kind contribution of the developing countries to the corporations and economies of the developed world. This suggested partnership should also be imitated at the national level by industries and business operations, by profit-sharing and human promotion through solidarity programs, for the benefit of the employees.

Two traditional examples of how little value is placed on the natural resources assets are the advantage taken by foreign corporations and investors in the exploitation of mineral resources, and of the scenic and touristic resources. Relatively little of the income made by these operations remains in the developing countries. Today we know that most of the developing nations which are endowed with mineral wealth are among the poorest. With regards to tourism, the value of the basic resources that make this enterprise possible is not recognized, and therefore the countries that possess them are not compensated for the contribution to the economic opportunities that they offer. Rather, very often, through power plays, foreign investors press for concessions and incentives from the host country, in order to make their operations even more profitable. Usually, the developing nation must borrow foreign exchange to develop the infrastructure so that foreign investors can take advantage of the touristic resources.

Part of the sustainable development efforts require that, in doing business, we revise the traditional role of lenders and borrowers, and become partners in sharing the profits derived from the natural wealth, not only for the benefit of the present generation but for the future ones as well. The income generated from a wise management of the natural resources can, in turn, be used to protect the environment, develop human potential, mitigate poverty, and generate a style of development which is environmentally viable, economically feasible, culturally appropriate and socially desirable.

Figure 1—An integrated systems approach methodology for planning national conservation strategies for sustainable development.

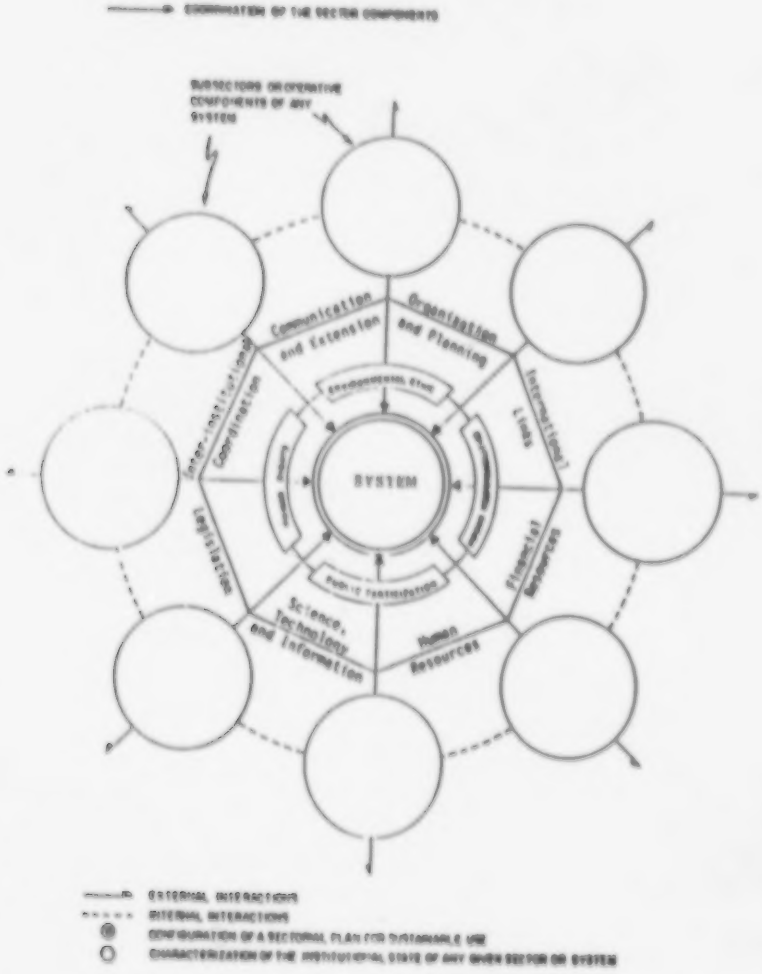


Figure 3—Components of the strategy (for any given system)

Figure 3—The strategy approach: a link between the system requirements and definition of priorities.

L'Institut de recherches politiques

Une présence nationale

Créé en 1972, l'Institut de recherches politiques est un organisme national et indépendant à but non lucratif, possédant des bureaux d'un bout à l'autre du Canada.

La mission de l'Institut est d'améliorer la politique d'État au Canada en encourageant un processus politique plus général, mieux informé et plus efficace et en contribuant à la mise en application de ce processus. Pour remplir cette mission, l'Institut :

- identifie les questions importantes auxquelles devra faire face le Canada dans un avenir à long terme et entreprend des recherches indépendantes sur ces questions;
- favorise la dissémination générale des résultats-clés des activités de recherches (celles menées par l'Institut et d'autres);
- encourage le débat impartial et la critique de questions de politique d'État, de manière à provoquer la participation de tous les secteurs et de toutes les régions de la société canadienne, et établit la liaison entre la recherche et les mécanismes d'apprentissage social et d'élaboration de politiques.

Direction de l'Institut

L'Institut est dirigé par un Conseil d'administration, conseillé par des représentants des gouvernements fédéral, provinciaux et territoriaux et d'autres organismes nationaux de recherche, ainsi que par des groupes d'experts venant de l'extérieur, qui se réunissent en comités consultatifs pour aider le Comité de recherches. Le président, en tant qu'administrateur en chef, est responsable de la mise en pratique et de l'administration des politiques et des programmes de l'Institut, ainsi que de la direction du personnel.

Mode de fonctionnement

L'Institut est décentralisé; ses chercheurs sont établis d'un bout à l'autre du Canada, ce qui permet d'assurer que toutes les régions contribuent aux recherches entreprises. L'Institut travaille également en collaboration avec des chercheurs particuliers ou des instituts d'autres pays.

Les chercheurs sont engagés sur une base contractuelle pour un temps limité, souvent pour la durée d'un projet spécifique. Cette politique permet à l'Institut non seulement de renouveler régulièrement son personnel de recherche, afin de refléter le caractère évolutif de son programme de recherche, mais aussi d'employer un plus grand nombre de chercheurs de premier ordre.

Indépendance et neutralité

L'indépendance de l'Institut est assurée par les revenus d'un fonds de dotation auquel ont souscrit les gouvernements fédéral et provinciaux, ainsi que le secteur privé. L'Institut obtient en outre des subventions et des contrats de la part des gouvernements, des entreprises et des fondations, pour soutenir les activités de ses programmes et pour mener à bien des projets de recherche particuliers.

L'Institut favorise la compréhension et la discussion publiques de questions d'envergure nationale, controversées ou non, et publie les conclusions de ses recherches avec clarté et impartialité. Il n'exerce aucun contrôle ou influence ni sur la conduite des projets de recherche, ni sur les conclusions qui en découlent : les recommandations ou les conclusions énoncées dans les publications de l'Institut sont strictement celles de l'auteur et n'engagent aucunement l'Institut, le Conseil d'administration ou les collaborateurs. L'Institut observe une attitude de neutralité envers les questions de politique d'État.

La décision de diffuser l'information au nom de l'Institut est la responsabilité ultime du président. Il bénéficie à cette fin des conseils du personnel de l'Institut et de ceux des lecteurs extérieurs, quant à l'exactitude et à l'objectivité d'un manuscrit. Seuls sont publiés les manuscrits qui traitent de façon compétente d'un sujet digne de l'intérêt du public. Les publications de l'Institut paraissent dans la langue de l'auteur et sont accompagnées d'un résumé rédigé dans les deux langues officielles.

Sustainable Development in the Caribbean

John Cox and C. (Sid) Embree

Sustainable development has been described as a matter of "life or death" for the inhabitants of a natural resource dependent area such as the Caribbean. Natural resource-intensity, often in products designed for export, has historically been one of the main features of productive activity in the region. Agriculture, forestry, fishing and, above all, tourism all depend for their economic success on a healthy and productive environment. For example, tourism is heavily dependent on the maintenance of delicate, diverse and densely coupled terrestrial and marine ecosystems; the arable land resource is so limited that agricultural policy will have to minimize negative impacts in terms of land degradation and agricultural pollution; over-fishing, degradation of mangroves and the congestion of maritime transport routes and port facilities threaten what might seem to be limitless coastal and marine resources; and investments in industry, energy, construction and infrastructure must take into account the impacts of pollution, hazardous wastes, conflicts over resource use and the assimilative capacity of the environment. This volume reports on the kinds of policy shifts that would be needed throughout the Caribbean, both nationally and regionally, to bring about more sustainable forms of development.

ISBN 0-88645-117-5

$19.95